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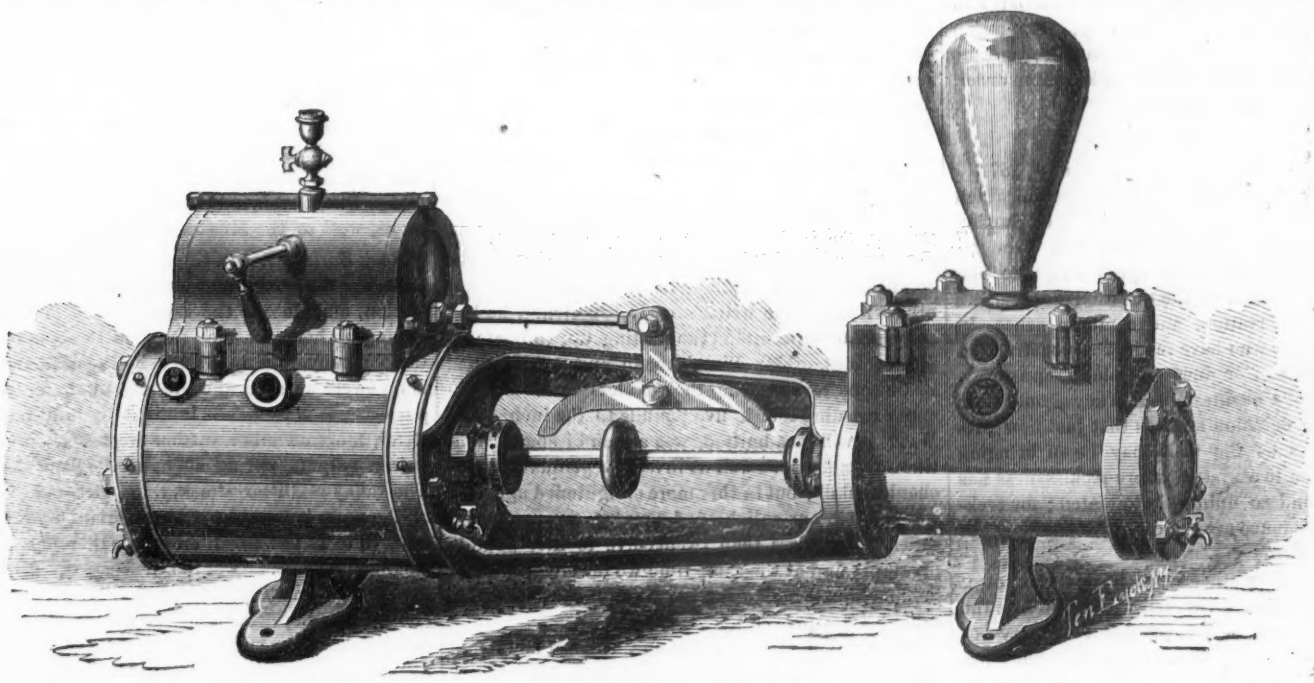
The Selden Direct Action Pump.

WITHIN the past few years, independent steam pumps have gained for themselves so enviable a reputation, that they now replace to a very great extent the old-fashioned force pump for supplying boilers, for draining mines, or in fact for raising water for any purpose. Such pumps consume no steam when not actually pumping water, and they can be made to work automatically by the introduction of suitable mechanism. They possess also the requirements of simplicity and economy, without which no pump will, at the present day, meet with the approval of engineers.

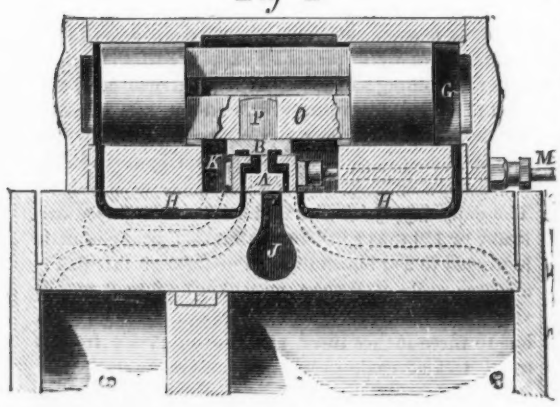


IMPROVED STEAM-PUMP.

The Selden pump differs in some important particulars from any other pump of its class. These may perhaps be best illustrated after detailing in a few words the qualities which a good pump should possess.

In the first place, the valves of the pumping cylinder, in spite of all precautions, may become clogged, and the efficiency of the pump may thus be greatly impaired, unless access to these valves for the removal of chips or dirt can be easily had. In the pump, which we herewith illustrate, the removal of the bonnets on either side of the air-chamber gives easy access to the valves, so that the engineer can, at any time, in a few moments assure himself that they are working properly, or make any alterations which he may see fit.

Fig. 2



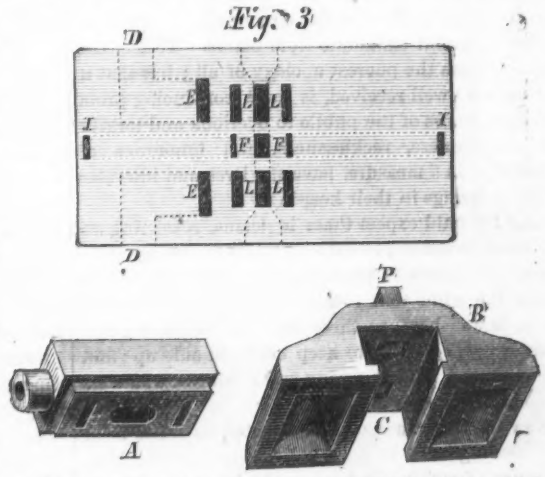
In the second place, the pump must be constructed with care, and of good materials, and the motion of the steam-valve must be automatic, not liable to get out of repair, and the pump must always be ready to start as soon as the steam is turned on. The latter requirement is absolutely essential when the pump is situated in a place not easily accessible, or at a distance from the boiler, as, for example, at the bottom of a shaft, when the boiler is on the surface.

The steam-valve motion in this pump is positive, being actuated directly by the pressure of the steam acting on the small plunger O. Each part is well made and accurately fitted; and as nothing but steam, water, and oil can reach the interior of the steam-chest, there appears but little likelihood of the mechanism becoming deranged, especially as the valve which admits the steam into the working cylinder is actuated by the steam itself, and not, directly, by any mechanism connected with the piston.

The steam cylinder and the pumping cylinder are each separate castings, provided with feet, by which the pump can be securely fastened to the foundation. A circular brace, the ends of which constitute the cylinder-heads, firmly unites the two cylinders. When so ordered, the interior of the pumping cylinder is lined with a non-corrosive alloy, so that the action of acid waters from mines will not affect it.

A collar or "boss" on the piston-rod touches, when the piston has nearly reached either end of its stroke, one of the arms of the rocker, the third arm of which is connected with a small valve-stem, clearly shown in our perspective view. This stem is connected with the small valve A (Figs. 2 and 3), which works within the main steam valve B. The valve A works in connection with the passages H H, which admit the steam to the ends of the auxiliary piston O (Fig. 2), which has a short reciprocating motion, as shown by the spaces G. The pump must, in all positions of the piston, start immediately whenever

Fig. 3



steam is turned on, because the main steam valve cannot be left so that steam will not be supplied to one side of the piston, which will always be free to move in the opposite direction. If the piston is at one end of the stroke when the pump stops, the port at the same end will be supplying steam, so that the back stroke will at once commence.

The main valve, B, is connected to this auxiliary piston, or plunger, O, by means of the ear, P (Fig. 3), and in this way receives a motion, not corresponding in time with the motion of the small valve, A.

By means of the valve B, steam is admitted through the ports at the ends of the large steam cylinder. The steam passages are indicated by the dotted lines in figure 2.

The arrangement of the steam ports is more fully shown in Fig. 3, but an actual inspection of the pump, which may be seen at the office of Mr. CARR, No. 43 Cortlandt street, New York, will prove more satisfactory than any verbal description.

The auxiliary piston is cushioned with steam at the last portion of the stroke, and the materials and workmanship are of excellent quality. The pump embraces no untried principle of action, and no special skill is required to run it and keep it in order.

The Westfield Explosion.

AUGUST 4, 1871.

TO THE EDITOR—Sir: The sad catastrophe which occurred on board the steamer Westfield, on Sunday last, seems to afford a fit occasion, if it does not make it a duty, for those to speak out, who can bring to the discussion of the question some share of experience, observation, and common sense—in other words, those who have made the construction and management of engines and steam apparatus, the occupation of a business life. They should have their say, on an occasion such as that just now presented, hopeless as the task may be of bringing about any reform in a system where recklessness has been so long and so uniformly tolerated; for recklessness and ignorance are the causes of most, if not all, such casualties.

In this, as in every other case I have ever known, the culpable party, or parties, tell the public that the cause of the explosion is a profound mystery—or they invent some new theory, or resort to old ones always ready at hand, to account for the disaster, no matter how unphilosophical or absurd the theories may be. For instance, we may mention the gas theory, once so popular, though with no probable ground to rest on—certainly none was ever demonstrated; or the more modern one, of unequal expansion and contraction; or another very convenient one, of low water, which has been so often called in to do service, and has so often given entire satisfaction to a large portion of the community, as though, if true, it would exonerate from blame. To me, the latter appears the poorest apology of all; but that it has been so well received, is most convincing proof of the readiness of the public to overlook and forgive the carelessness, recklessness, and ignorance of those who, in a measure, have the lives and interests of fellow-beings in their keeping.

Now I should expect these logicians, reasoning on the same principle, in case of a vessel's being overtaken by a squall of wind and capsized, to deny that it was the wind that caused the disaster—but, forsooth, it was because there was not ballast enough in the vessel's bottom to keep her right side up; and the argument, though wrong end foremost, would be as good in one case as the other.

Now the true cause of this disaster, as it has been in preceding cases of the kind, was doubtless a high pressure of steam—so high as to be dangerous in any large boiler, and especially in an old one; for no moderate pressure could produce such effects as those on board the Westfield. To say, as some not very wise men have, that steam never bursts a boiler, is, in my opinion, very wide of the truth. The ignorance of the acting engineer is indeed pitiable, as appears by his testimony just given under oath, and well illustrates the adage, that those who know nothing, fear nothing.

Now I undertake to assert, without fear of contradiction, that such accidents do not occur on boats, or elsewhere, except when high steam is used, if not daily and constantly, at least occasionally, no matter whether in a condensing or a non-condensing engine. Low steam, using language in its true and proper sense, does not possess sufficient energy to blow everything within gunshot distance of the boiler sky-high in a moment; and my theory of steam is the simple one, that when the pressure is not restricted and kept within some reasonable limit, it is entirely capable of producing all the effects, and even greater ones, than those on board the ill-fated Westfield.

It is, I believe, a well-settled axiom, that if two men ride on the same horse, one has got to ride behind. It is an equally incontestable fact, that if a steam-boiler is subjected to a pressure beyond its capacity to bear, it must give way, and the force of the explosion will be governed by the law of cause and effect. It follows, then, that entire immunity from accidents cannot be depended on when high steam is used, for no human foresight can entirely guard against them. But you must not infer that I condemn the use of high steam altogether; though I do decidedly condemn its use on boats or vessels used for carrying passengers.

For land purposes, such as for use on railroads and in other situations where water for condensing cannot be had, high steam must be used; and when the conditions justify it, then let it be used, and not otherwise. In the writer's early experience, he had occasion to superintend the putting up, in boats, of four engines, of Mr. WATT's make, and none of them had means of supplying their boilers under a pressure exceeding four to five pounds to the inch. Mr. WATT, it will be admitted, was a man of some scientific attainments, as well as inventive genius and mechanical skill; but in this more enlightened age, and especially in our enlightened country, we cannot be satisfied with less than twenty-five to fifty pounds pressure; and at the same time we deceive the public, and abuse the engine on which it is worked, by calling it low pressure.

I know that this is a fast age. Speed is important, time is valuable, but so is human life too. I therefore enter my protest, while I may, against the false theories, and, allow me to add, some of the bad examples of the present time.

My philosophy has always taught me to account for causes and results in the most natural and simple way consistent with reason and sound judgment—hence the conclusions stated above.

AN OLD ENGINEER.

Wyoming Coal.

EVANSTON, July 18, 1871.

TO THE EDITOR—Sir: When the Union Pacific Railroad Company built its road across the wide plains between the Missouri and the Rocky Mountains, and further on across the dreary Bitter Creek Desert to Green and Bear River Valleys, it was not known that the road would open up a coal field of vast extent, and of the greatest importance, for its own prosperity. Independent of the prospective trade of such a coal field, the fact that the road has now convenient coaling stations immediately along its route, indicates an enormous saving in its running expenses, which is the more important, as ordinary local traffic in an almost unsettled country must be naturally very limited for years to come.

Coal has been discovered all the way from a point 100 miles west of Cheyenne to Echo Cañon, a distance of about 375 miles. Here three coal beds have been principally worked, at Carbon, at Rock Springs, and at Evanston. The geological horizon of these beds in relation to each other has not been definitely determined, but from the general westerly dip of the strata, it is inferred that the Carbon coal is the lowest of the three, and the Evanston bed the highest. A still lower one has lately been opened, immediately at the western slope of the Black Hills. When the local disturbances, which are of frequent occurrence, shall have been better studied than is at present the case, this order of superposition may possibly be slightly altered.

The Wyoming Coal Company, which has the contract to supply the Union Pacific Railroad, works mines at all three of the above-named points, and the Rocky Mountain Company, which supplies the Central Pacific road, works the same bed in three different places at Evanston.

The Carbon seam, 140 miles west of Cheyenne, is opened immediately by the side of the railroad track, by a shaft 70 feet deep. Like all the Wyoming coals, this coal is a lignite, but very compact, and full of resinous matter, which, being finely distributed throughout the bed, is also often found in translucent patches, very similar in appearance to amber. Before November of last year, this coal was extensively mined; but the unfortunate fire, which broke out in the bed at that time, has closed the mine. Spontaneous combustion is reported to have been the cause of the conflagration, and it was found impossible to stop it. It was finally extinguished, after the pillars had been burned out, by the caving of the overlying strata. The coal is said to be 8 to 10 feet thick, and the mine is now being re-opened, and will, no doubt, soon be again in active operation. The coal is found to be the best for gas purposes, west of the Missouri.

Rock Springs lies in the midst of the Bitter Creek Desert. The coal mines are about a mile east of the station, and close to the track. A little village has sprung up here, most of the houses being owned by the company, and inhabited by the miners. There is no sweet water in the vicinity, and, for domestic purposes, it is therefore brought by rail from Green River, fourteen miles further west. There is, however, a sulphur spring about a mile from the mines. The valley of Bitter Creek, a dry stream at this time of the year, is here entirely underlaid by a seam of coal, 10 to 12 feet thick, and a smaller one of about one foot above it. Towards the east, the same seams appear in a small hill of 8 or 10 acres, some 150 feet above the valley. All around this hill the coal is exposed to view, except in a narrow strip of about 200 feet in width, where the bed connects with the portion running under the valley. The strike of the rocks is here nearly north and south, the dip 5° to 8° slightly south of west. At present, coal is only extracted from the hill by pillar work; but an incline has been sunk on the same bed, close to, and under the railroad track, about a half mile west of the hill. The mouth of this incline is intended to be the point to which the coal from under the valley, and that from under the slope of the hill, is to be brought, the work being done by the same engine.

The Rock Springs coal is very firm, and full of resinous matter. It makes very little ash, and does not fall so easily to pieces on exposure to the air, as other Wyoming coals. It is a good gas coal, and well fitted for steam purposes, and for use in reverberatory furnaces. For the blast-furnace, it is not applicable, as it does not coke, and splits up into small angular fragments on exposure to the heat. The daily supply from the mines is about fifteen carloads, or 150 tons; but in winter this production is increased to 200 tons a day. The floor of this bed is a coarse white sandstone, on which lie 8 to 9 feet of very clean coal. Next comes a seam of slate, from one to three inches thick, and above this are from 3 to 3½ feet of coal, overlaid by an arenaceous shale. The coal is only removed up to the band of slate, which, together, with the coal above it, furnishes a very good roof.

At Evanston, the coal now worked measures 22 feet in thickness, which is increased in the middle mine of the Rocky Mountain Coal Company to 26 feet. The mines are three miles northwest of Evanston, in Bear River Valley. The bed shows, in the dif-

ferent inclines sunk upon it, a dip of from 20 to 26 degrees northeast. Commencing from below, the strata exposed in the Wyoming Coal Company's mine show the following order and thickness :

Soft shale	4 feet	0 inches.
Indurated calcareous clay	4 "	6 "
Calcareous and argillaceous spheroside-rite	0 "	8 "
Indurated calcareous clay	4 "	6 "
Coal	0 "	4 "
Argillaceous limestone	2 "	0 "
Slate with thin seams of coal	3 "	0 "
Coal with 9 inches slate in the middle of the bed	4 "	0 "
Shale and slate	10 "	0 "
Dark bituminous fire clay	5 "	0 "
Slate with coal seams and impressions of leaves	2 "	0 "
Coal	8 "	0 "
Hard bone-coal	0 "	3 "
Coal	0 "	4 "
Slate	0 "	3 "
Coal	2 "	0 "
Slate	0 "	5 "
Coal	2 "	0 "
Slate	0 "	2 "
Coal	8 "	0 "
Slate	0 "	4 "
Coal	0 "	10 "
Sandstone	1 "	0 "
Shale	4 "	6 "

The incline in this mine is 850 feet long. Galleries are driven both ways, at 150 feet below the surface, and again 192 feet below this point. The upper one is driven in on a level 600 feet to the northwest, and 450 to the southeast ; the second one, 70 feet northeast, and 50 feet southeast. From the galleries oblique, ascending gangways are driven on the upper side, every 50 feet, and from these the chambers start right and left, the breasts being 20 feet, and the pillars 18 feet wide. Ventilation is as yet satisfactorily maintained by a small furnace in the mine. The pump is in the bottom of the mine, and the steam is conducted to it from above.

The Rocky Mountain Company has opened the bed on the same hill by three inclines, from the middle one of which all the coal is at present raised, the others being not yet quite prepared for work. It is expected that by January 1st, 1872, the machinery on all three inclines will be in running order. Their combined capacity will be 1000 tons per day. On the middle mine the company have erected an excellent 60-horse power hoisting-engine, built by BOOTH & Co., of San Francisco, with which they hoist 10 cars at a time. The incline is straight to a depth of 270 feet, where a fault in the vein was encountered, letting down the coal abruptly 8 feet. A slight curve in the incline was here necessary, from which it is sunk again in a straight line to a total depth from the surface of 486 feet. With the exception of a slight variation in the size of the working chambers and pillars, this mine is worked on the same plan as that of the Wyoming Coal Company. The lower seam, which is alone taken out at present, as in the Wyoming Company's mine, is here 9½ feet thick, instead of 8 feet, as above given in the enumeration of the strata. The coal and slate above make a firm roof, if the chambers are not over 18 feet wide. It is intended to mine in the future workings the upper 8-foot bed. For this purpose, one side-gallery has been run obliquely across the coal-bed on the lower side of a main gang-way until it strikes the roof of the upper seam. The sandstone roof seems to be sufficiently strong. This mine now delivers 150 tons per day.

The northern incline is in 120 feet, and two gangways are started from it 85 feet from the surface. The coal-bed is here, also, 26 feet thick. Machinery for this mine is on the ground, and will soon be erected.

The incline on the southern mine, nearest to that of the Wyoming Coal Company, is down 386 feet, and two sets of levels are driven in right and left for some distance. The mine is, however, not worked yet, the engine not being in position. The work in all these mines has been done very neatly and accurately. The Rocky Mountain Company employs mostly Chinese, a sufficient number of English and American miners being only retained to train the former. The Wyoming Company employs English, Scotch, and American miners at Evanston, and Scandinavians at Rock Springs. Wages vary from $1 50 to $2 50, with board. The Evanston coal is lean, and exhibits almost no stratification, while cross-seams are extremely numerous, so that undercutting is carried on at a disadvantage ; and the production of a vast amount of slack is the consequence, which is filled in on the lower side of the main gangways, so as to level them. The coal, and especially the slates, containing much iron pyrites, and the layers of slack often being from 4 to 5 feet thick, there is great danger of spontaneous combustion ; and the Wyoming Company intends, therefore, to hoist in future the greater part of the small coal and burn it on the surface.

A. E.

Polytechnic Club of the American Institute.

MAY 25, 1871.

The President, (Prof. S. D. TILLMAN) read the summary of scientific news.

I. NEW COAL MINES IN INDIA. *The London Mining Journal* contains some interesting statistics with reference to the newly-discovered coal mines of Berar, in India. The total area of the coal-fields is more than 1,000 square miles, and the coal is easily accessible. Lately, a vein of coal was struck 77 feet from the surface, and 30 feet of coal was pierced without the bottom of the seam being reached. The area of one field, called the Damuda, is estimated at 149 square miles, and the average thickness of the vein at 40 feet. Valuable beds of iron ore have also been found in the Woon district, containing from 53 to 68 per cent. of iron.

The President remarked that probably the coal found was bituminous.

II. INTERESTING EXPERIMENTS ON COLOR. — Dr. CLERK MAXWELL recently made some striking experiments on light and color at the Royal Insitution London. A mixture of blue and yellow pigments produced a green color. When discs of blue and yellow light were projected on a screen and made to overlap, the combined lights produced not a green color, but pure white. In the same manner, by throwing red and green rays upon the screen, the area of the junction gave the impression of a brilliant yellow. Similar colors have been thus combined by American experimenters, but with very different results from those obtained by Mr. MAXWELL.

Mr. J. K. FISHER. I think Dr. MAXWELL is very much mistaken. I do not believe he has a good perception of color. That blue and yellow rays will produce white is contrary to all the theories and experiments of philosophy ; for they produce green. Blue, yellow, and red rays will produce white.

Dr. P. H. VAN DER WYYDE. It is very curious ; but although it is utterly impossible in the chromoscope to make blue and yellow produce white, or to blend a red and a green disc to produce yellow, yet it is true that blue and yellow light produces white. We must distinguish between the prismatic colors and the common pigments. If you throw upon a screen, by means of a prism the seven colors, and intercept all but the green rays, you may look at that green disc through another prism, and you will see no color but green. But look through the prism at a disc painted green, and you will see blue and yellow. The blue and yellow mixed in the pigment produce a color corresponding to the mean undulation velocity. The number of undulations per second of the yellow light is about 500 millions of millions, of blue lights about 700, making an average of about 600, which corresponds to green light. But the prismatic green rays all have 600 millions of millions of undulations per second, none moving faster and none more slowly ; so that the prism cannot separate them.

In the same lecture, Dr. MAXWELL speaks of a yellow spot in the eye. I have not much belief in that. There is a spot in the retina where the optic nerve passes through it ; the fibres separating and feeling the image from the front, like so many transparent fingers ; but that spot is insensible.

Mr. FISHER repeated his belief that blue and yellow, whether pigments or rays, produce green, and that red and green produce a neutral tint ; and inquired if the eye could distinguish between a pigment reflecting pure green rays and one reflecting blue and yellow rays.

Dr. VAN DER WEYDE.—No ; but the prism can do it, and the spectroscope can do it still better.

III. NEW METHOD OF PAINTING.—M. VIOLETTE, the inventor of a new method of painting, employs a so-called pulverizator (a spray-producing instrument) for applying liquid pigments and dyes to the surface of textile fabrics, paper, etc. The colored liquid is projected in an impalpable spray, and made to fall, to any desired depth, on the objects to be painted or dyed.

IV. PRESERVATION OF MEATS.—E. PELOUZE gives, in the *Moniteur Scientifique*, the following description of his process :—The meat or other animal substance, first cut into pieces of convenient size, is placed for some time in an atmosphere of carbonic oxide gas, under pressure. After this treatment, the material is dried in a current of dry, cold air, so as to remove all traces of moisture from the substance ; it is then treated with an antiseptic solution—either a concentrated brine or a solution of saltpeter, or water with pure carbolic acid. Finally, it is packed in hermetically sealed vessels.

THE FORCE OF DETONATING GASEOUS MIXTURES.—Dr. BERTHELOT has completed his investigations on the force of gunpowder and other explosive substances, by presenting in the *Moniteur Scientifique* a table of explosive mixtures, consisting of oxygen with various gases and vapors, also the amount of heat and pressure produced by one kilogramme of each mixture. According to this review, the maximum effect of each mixture varies only from one to two, and is about equal for the several hydrocarbons and the vapors of ether and benzine ; but this effect surpasses that of all solid, as well as of all liquid, explosive compounds. With hydrogen and oxygen, for instance, it is five times greater than that of powder, and 2½ times greater than that of nitro-glycerine. The gaseous mixtures experimented with are supposed to be under atmospheric pressure. The pressure theoretically exerted by them is between 20 and 49 atmospheres, each at 15 pounds pressure to the square inch, and is very greatly different from the pressure exerted by the most of the solid and liquid explosive substances we are acquainted with ; a result the very opposite to that which was supposed to be the case by most people until now. In order to obtain a pressure more nearly like that exerted by solid and liquid explosive substances, it would be required to compress the bulk of the explosive gaseous mixtures until their density was nearly that of the explosive solids and liquids. Leaving out of the question for the moment the difficulty of this operation, the result would be liquefaction of most of the hydrocarbonated gases while the oxygen remained in a gaseous state, and the destruction of the homogeneity of the explosive mixture, and accordingly, also, the possibility of obtaining its instantaneous explosion by a spark.

Dr. VAN DER WEYDE.—In rating the effect of explosive mixtures, the velocity is often overlooked. Gunpowder is weak, because it burns so slowly. White gunpowder, made with chlorate of potash, burns six times faster; and for that reason does not answer the purpose of gunpowder. In making gunpowder for large guns, it is necessary to make it in larger grains, to make the combustion slower ; but in blasting we want sudden expansion. The fulminates do not produce more gas than gunpowder ; but the enormous velocity of the production of the gases makes the difference. A mixture of hydrogen and oxygen will explode in the open air ; but gunpowder in the open air only burns rapidly. For projectiles we want the combustion to be so regulated that the last grain of gunpowder shall be burned at the moment the ball leaves the musket.

Prof. JOHN PHINN.—If you lay two trains, one of gunpowder, and another, crossing it, of fulminate of mercury, the gunpowder will burn to the point where the other crosses it, and no farther. The fulminate will scatter the gunpowder without igniting it, and the rest of the train of gunpowder will be left unconsumed. But if you confine the gunpowder, so that the fulminating mercury shall give it a hard blow and explode it at the same time, it increases the force of the explosion.

Dr. VAN DER WEYDE.—That is the reason that gunpowder is more effective with percussion caps than with flint.

Prof. PHINN.—Fulminating mercury must be mixed with something else in order to fire gunpowder. Mix together a quantity of iron filings and of fine hard-grained powder, and throw them through an alcohol flame, and the iron filings will burn, and the gunpowder will not.

DR. VAN DER WEYDE.—If you try to ignite gunpowder by means of an electric spark from a machine producing electricity of tension, it will not burn. But take a wet thread, and pass the current through it, so as to make the spark move slowly, and it will ignite. A large Rumkorff coil will not ignite a match. The electricity flies around it. But dip the match in water, and it will ignite at once.

Prof. PHINN.—Place the substance between two wires, and you can ignite either the powder or the match.

The Iron Ores of Great Britain.

By WILLIAM B. POTTER, E. M.

IT is safe to say that no country in the world, with the same amount of territory, can at all compare with Great Britain in the matter of iron ores. There are many that are richly stored with these really precious ores, but none that have the same peculiar natural advantages for the practical working of them, whereby they are rendered useful to the wants of civilization. This country, for instance, which can boast of greater and richer stores than perhaps any other, yet has them scattered over immense tracts, in many cases far from any permanent supply of suitable fuel; and in the old world there are many countries that have an abundance of ore of the best quality, but no fuel except charcoal, and that necessarily in very limited quantities. In Great Britain, however, the supply may be said to be inexhaustible and this supply is so disposed about the kingdom as at all points to be within easy reach of at least one of the many coal fields, resulting in reciprocal advantages—an impetus given to coal mining operations, and suitable fuel for the smelting of the ore. In addition to this, the variety in the composition of the ores is such that iron of every grade can be produced from the most ordinary to that which is admirably adapted to the manufacture of Bessemer metal, and can be produced in such quantities, too, and at such rates that not only are the wants of the country at home fully supplied, but the rest of the world furnishes a market for a very large share.

A brief notice of these ores, of their general occurrences, and their distribution and use, it is thought, may not be uninteresting to our readers.

From the latest reports of Mr. HUNT, keeper of the Mining Records, in the year of 1869, iron ore to the amount of 11,508,525 tons was mined in the United Kingdom, the value of which at the mine, before any charges for movement were added, was about $18,662,800, and from this ore were obtained 5,447,757 tons of pig iron, valued at about $68,071, 985.

The following table gives the general varieties of these ores, together with the amount of each used:

Magnetite,	about	270,100	tons or	2	per	cent.
Red Hæmatite	"	1,832,326	" "	16	"	"
Brown "	"	1,175,648	" "	10·5	"	"
Spathic Carb.	"	53 458	" "	0·5	"	"
Impure Carbonates	"	3,407,819	" "	29·5	"	"
Argillaceous	"	3,278,066	" "	28·5	"	"
Black Band	"	1,477,875	" "	13·	"	"

The Magnetites, which in this country, form so important a part of our supplies, hold, in Great Britain, a very subordinate position. In the west of England there are several deposits which are being worked to the extent of a few hundred tons a year, as at St. Austell, in Cornwall, and Dartmoor, in Devonshire, but by far the most important deposit is that which occurs at Rosedale, in Yorkshire, in connection with the Cleveland ironstone in two huge troughs from 150 to 250 feet wide. At the top of these troughs the ore appears, in loose irregular masses, but at some distance below the surface it assumes an irregular stratified form. No very satisfactory conclusion has been arrived at, as to the origin of this deposit, some holding to the opinion that it is the metamorphosed Cleveland ore, which is an impure carbonate, and others, that it is itself a volcanic dyke. These magnetites are inferior to those of this country and Sweden, yielding on an average about 55 per cent. of metallic iron.

The Red Hæmatites are now the most valuable of the British ores, being almost the only ores pure enough to be used for the production of Bessemer pig iron. The most important deposits are found on the west coast of England, in West Cumberland and Northwestern Lancashire, occurring in the Sub Carboniferous or Mountain Limestone and often extending into the conglomerate above, or lying between the two in irregular masses. It is an anhydrous peroxide of iron, and results from the decomposition of the limestone, the iron, of which there is usually a large amount in this formation, being oxidized and filling the pockets and cavities originally in the limestone, as well as those formed by the process of decomposition itself. The same thing is to be seen in this country wherever this limestone occurs. The vast deposits of hæmatites and limonites of Kentucky and Tennesse, are all the result of this same action, only in the case of the limonites it has been carried somewhat farther, giving a hydrous peroxide. In composition, the red hæmatites of the west coast of England, are to be compared with the hæmatites of Lake Superior, being very siliceous and remarkably free from sulphur and phosphorus. The average yield of metallic iron is about 63 per cent. in the best qualities and the amount of sulphur and phosphorus from a trace to ·02 per cent. These ores are smelted in the district and a large percentage shipped to various parts of the country, as South Wales, Scotland, Staffordshire and Yorkshire, to be used with other ores. Near Cardiff, in Glamorganshire, South Wales, there is quite an extensive deposit of red hæmatite, also associated with subcarboniferous limestone, which is smelted in the district. It is not so rich, or so pure as the hæmatites of Cumberland and Lancashire, and resembles very much in composition the hæmatites of Kentucky and Tennessee alluded to above.—*The American Chemist.*

[To be Continued.]

Correspondence from Eastern Oregon.

BAKER, July 27, 1871.

TO THE EDITOR: Sir—"Auburn" is not yet played out, if we may judge from the receipts of gold dust from that quarter. The few white miners there seem to be doing well, and from the large quantities of opium and good things passing the express office, the Chinese must be making money. The Auburn Ditch Company is not doing much this season; in fact, we have throughout all our camps the chronic disease—want of water. Granite, Olive, Fort Sumpter, and the camps in Grant county seem to be doing as well as ever.

Eldorado, Malheur, Aurelia and Humbolt Basin are dry. Clark's Creek has been the best camp this season, so far. The ditch at Eldorado is progressing finely. Pocahontas, thus far, has not come up to our expectations. The new steam mill, 10 stamps, erected by OLDS, SIMONTON & Co., has made a run on "Young America" rock, but did not pay. I do not think they saved their gold. The mill is open for custom work. Rock Creek is about the same as Pocahontas.

In the Eagle Creek district, Messrs. PACKWOOD & PERKINS are pushing their ditch rapidly. They have some 180 white men and Chinese at work, and will have water on Shanghai and at Gem and Sparta this fall. FISK is about to sell his ditch to PACKWOOD & PERKINS. This will be a good camp.

We have some fine prospects from a new lode in Grant county of argentiferous galena. I will tell you more about it next time.

The shipments through public sources have been, if anything, heavier than last season, although trade has been rather duller. The farmers have a fine crop of grain and hay, and generally our country is prosperous. DURKEE is pushing his ditch on Burnt river as fast as his limited means will admit. Success to him.

CRANE, VIRTUE, BROWN and others have incorporated on the old Ruckle mine, and are about to erect a 25-stamp mill at the mine. S. W. R.

Phosphorus in Iron and Steel.

A METHOD of determining the amount of phosphorus in iron and steel is thus stated by Prof. C. A. JOY, in the *Journal of Applied Chemistry:*

In the proceedings of the Chemical Society of Berlin, we find a method of analysis of iron proposed by F. KESSLER, which appears to be easy of execution, and to afford accurate results. The process is briefly as follows; 5.6 grains of the substance are digested with nitric acid, evaporated to dryness, strongly ignited, dissolved in hydrochloric acid, reduced with sulphuretted hydrogen gas, treated with a solution of 42 grms. of ferrocyanide of potassium, the whole diluted to 518 cubic centimetres instead of 500, allowing 18 c. c. for the volume of the precipitate; 250 cubic centimetres of the filtrate from the above are measured off, and sulphate of magnesia and aqua ammonia added to precipitate the phosphorus, which is afterwards determined as pyro-phosphate of magnesia in the usual way: 1 decigram of the magnesium phosphate indicates 1 per cent. phosphorus in the iron.

The author prepared a series of test mixtures of known constitution, varying from 1 per cent. to 0.020 per cent. phosphorus in order to prove the accuracy of the method, and gives the following table of results:

Known Composition.	New Method.	Old Method with Molybdic Acid.
1.00	0.990	1.005
0.100	0.105	0.110
0.020	0.025	0.021

Three samples of iron were analyzed according to the old and new process. A, soft cast iron; B, white cast iron with 12.5 per manganese; C, steel. Phosphorus obtained.

	A	B	C
According to new method	1.025	0.185	0.035
With molybdic acid	1.02	0.185	0.030

As KESSLER'S method enables us to dispense with the highly expensive molybdic acid, and appears to give accurate results, there would appear to be no objection to its general adoption. A ready way of determining phosphorus in ores has become of great importance since the introduction of the Bessemer process, and the above treatment may supply the want that has been felt by our ironmasters.

Parisian Butter.

A PARIS correspondent of *Engineering*, in speaking of the extremity to which the inhabitants were reduced during the siege, and the means which were resorted to for obtaining, or, we might say, manufacturing, food, mentions the following:

The horse presents in the various parts of its tissue and bones several varieties of fat—some liquid, like olive oil, others resembling butter in consistency, and all free from any disagreeable odor. These substances were used in Paris, during the siege, for culinary purposes, when the oil and butter were exhausted. The extraction of the fatty matter was conducted as follows: The adipose tissues, separated from the laminæ, were bruised between the fluted rollers of a crushing mill, which tore the cells in a temperature of about 100° centigrade, when the fluid fat exuded, the contraction of the tissues aiding the expulsion of the grease. The marrow was either extracted from the bones, or they were crushed and thrown into warm water, and the fat afterwards collected; no further process being required to render it fit for use. The bones of sheep and oxen also yielded fat, but it retained a slight odor, suggestive of its origin.

A skilful and active manufacturer, M. DORDRON, partly succeeded in removing this flavor, by steeping the fat in a warm infusion of alkali. This preparation was sold during the siege under the name of "Parisian butter," which was much improved by mixing it with horse fat.

Another experiment to produce a substance for supplying the place of butter was tried, by mixing suet and colza oil. The disagreeable taste and odor of these materials were partly removed by exposing them to the action of a fine water spray. The vapor which arose carried off in a measure the volatile acid, causing the nauseous odor.

THE COAL TRADE.

B. B. WESTERN, COAL EDITOR.

Anthracite Coals.

NEW YORK, August 11, 1871.

WHOLESALE.—There is only little change to note in the market this week. The warm weather has caused trade to slacken up a little, but the demand for Lehigh Coal is unabated. The largest amount of Coal ever passed from any one region during a week was made for the week ending the 5th inst. for the Schuylkill region, when 501,791 tons were carried. This was done to avoid the advance in tolls, noted to take place on the 15th inst.

Dealers had better lay in their supplies now, before any further advance in tolls or freights take place. As the season advances prices also are likely to go up.

Prices remain firm, our quotations are all correct, and may be relied upon.

Freights remain at our quotations.

Cumberland Coals are in good demand from manufacturers and steamship companies. We quote $6.50 to $6.75 alongside in barges.

Foreign and Provincial Coals are quiet.

Anthracite Coal Trade for 1870 and 1871.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending August 5, 1871, compared with week ending August 6, 1870.

COMPANIES.	1870. WEEK.	1870. TOTAL.	1871. WEEK.	1871. TOTAL.
*Phila & Reading R.R.	67,880	1,314 751	109 257	1,991,738
Schuylkill Canal	8,763	108,246	35,4:3	501.252
Lehigh Valley R. R.	56,565	1,884.390	75,252	1,035.571
Lehigh & Sus. R. R.	15,703	557.9:0	35,617	623,663
Lehigh Canal	25,371	325.053	26,949	247,168
Scranton North	16,735	425.390	18.983	187 807
" South	30.249	1,054.919	39.516	451.323
Penn. Coal Co., rail	24,955	670.747	28,996	285 433
" " " canal	491	10,277	599	5.907
Del. & Hud. Canal Co.	47.327	88 ,696	34,859	390.798
" " East	5,551	228 346	9.626	150.995
" " West	1.629	48.432	4.139	44.388
South	12.538	270.954	10.409	136,697
Shamokin	8,990	235,142	13,141	374,475
Trevorton	2 717	47.832		
Lykens Valley Coal Co.	2,620	25,906	2,051	52,162
Wyoming South	....	135,349	....	....
Wyoming North	....	....	....	4,167
P. N. Y. U. & R R. Co.	4.456	178.995	....	104,987
Williamstown Col'y	6,732	171,491	....	....
Big Lick Col	1,487	42,124	3,753	79,452
Total	340,749	8.617 010	448,620	6,667,983
1870		6,667,983	340.749	
Decrease		1,949,027		
Increase			107,871	

* Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1870 and 1871.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending August 5, 1871, compared with week ending August 6, 1870.

COMPANIES.	1870. Week.	1870. Year.	1871. Week.	1871. Year.
B. & O. Canal	11,936	295 366	13,386	382,411
C. & O. R. R.	14,234	489,579	24,259	729,048
H. & B. T. R. R.	5 382	185 230	3,662	210,947
Harrisburg & D.	17,755	468,591	15,024	404,635
*L. V. R. R.		9,380	8,061	238,354
P. & N.Y.C. & R. Co.	5,721	145,453		
Cumberl'd Branch Canal	1 909	55 274	4,074	109,175
" " Railroad	2,330	59,719	1,270	44,695
Total	59,267	1,708,592	69,736	2,199,215
			59,267	1,708,592
Increase.			10,469	490,623

* From this week the tonnage of the P. & N. Y. C. & R. R. Co. will be included in that of the L. V. R.R. Co.

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Sus. Div.)

Week ending August 5—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1871. tons ct	WEEK 1870. tons ct.	YEAR 1871 tons cwt.	YEAR 1870. tons cwt.
Wyoming Region	35394 04	27695 02	656331 05	695513 00
Upper Lehigh Region	4066 12	3967 14	27276 15	83001 15
Beaver Meadow Region				
Hazleton Region	8299 00	10718 05	50012 02	158313 16
Mahanoy Region				
Treskow Region	2565 06		17640 02	
Mauch Chunk Region	7101 13	427 12	95554 17	30743 02
Totals	57426 16	42808 13	846818 01	967571 13
Increase	14618 03			
Decrease			120753 12	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	35616 12	15702 13	623663 08	557980 09
Forwarded East of Mch Chunk by Canal	16426 05	20767 01	133487 17	250001 17
Delivered at and above Mauch Chunk	1118 15	1017 10	33010 09	24651 19
Delivered to L. & B. R. R. at Plymouth Bridge	3894 19	4627 08	35798 01	120246 10
L. V. R. R. at Packer'n	370 05	694 01	20858 06	14690 18
Totals	57426 16	42808 13	846818 01	967571 13
Of the above there was transported on acc'nt of L. C. & N. Co.	10625 00	427 12	130631 18	47396 19
W.-B. C. & I. Co.	21490 16	12298 15	481843 11	312201 03
Totals.	32105 10	12726 07	612480 09	359598 02
Increase	19379 03		2528e2 07	
Decrease				

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, August 4, 1871.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair	34,300	05
" Port Carbon	7,324	10
" Pottsville	2,431	18
" Schuylkill Haven	35.122	09
" Pine Grove	6,021	08
" Tamaqua	20,783	09
" Harrisburg	42	07
" Dauphin	7,050	13
Total	113,076	19

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	11,300	02
" Mill Creek "	2,491	04
" Schuylkill Valley Scales	1,176	02
" Mt. Carbon "	1,894	07
" Cressona "	14,663	01
" Pine Grove "		
" Tamaqua "	2,449	01
Total	33,974	01

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap	1,711	15
" Shamokin	3,500	01
" Herndon		
Total	5,211	16

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	1,454	00
" Lebanon & Pine Grove Branch	1,723	14
Total	3,177	14

CONSUMED ON LATERALS.

From Frackville Scales	666	02
" Mill Creek "	489	03
" Schuylkill Valley Scales	685	06
" Mt. Carbon "	1,121	13
" Cressona "	242	13
" Pine Grove "	62	02
" Tamaqua "	245	19
Total	3,512	18

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.		
" " Alburtis, " "	30	01
" " Oreland, G. & N. Br.	857	04
" " Connecting R. R.		
" " Willow Street R. R.	246	10
Total	1,133	15

BITUMINOUS.

From Harrisburg	5,803	19
" Connecting R. R., G. & N. Br.		
" Junction R. R.	10	00
Total	5,813	19

COAL FOR COMPANY'S USE.

Anthracite	3,702	11
Bituminous	264	05
Total.	3,966	16

RECAPITULATION.

	Total for Week.	Corresponding week last Year.	
Passing over Main Line and Leb. Val. Branch	113 076 19	89,944 14	i 23,131 05
For Shipment by Canal	33,974 01	12,708 17	i 21,265 04
Shipped Westward via Northern Central R. R.	5,211 16	7,057 02	d 1,845 06
Shipped West or South from Pine Grove	3,177 14	704 14	i 2,473 00
Consumed on Laterals	3,512 18	2,244 14	i 1,268 04
Lehigh and Wyoming Coal	1,133 15	572 08	i 561 07
Total Anthracite paying fr'gt	160,087 03	113,232 09	i 46,854 14
Bituminous	5,813 19	10,343 04	d 4,529 05
Total of all kinds paying fr'gt	165,901 02	123,575 13	i 42,325 09
Coal for Company's use	3,966 16	2,083 00	i 1,883 16
Total Tonnage for Week	169,867 18	125,658 13	i 44,209 05
Since Dec. 1, 1870	3.130937 02	202.978 17	i1118058 05
Total to date	3,300965 00	2146637 10	i1162267 10

SHIPPED BY CANAL.

	Total for Week.	Corresponding week last Year.	
From Schuylkill Haven	32,615 00	9,223 02	i 23,391 18
" Port Clinton	2,858 00	171 00	i 2,687 00
Total Tonnage per Week	35,473 00	9,394 02	i 26,078 18
Since Dec. 1, 1870	465,779 03	101,341 09	i 364437 14
Total to date	501,252 03	110,735 11	i 390516 12

Philadelphia and Reading R. R.

Amount of coal transported on the Philadelphia and Reading Railroad during the week ending Saturday, August 5, 1871:

	tons.	cwt
From St. Clair	34,300	05
" Port Carbon	7,324	10
" Pottsville	2,431	18
" Schuylkill Haven	35,122	09
" Auburn	9,264	09
" Port Clinton	20,783	09
" Allentown and Alburtis	30	01
" Harrisburgh and Dauphin	15.024	07
Total paying freight	124,281	08
Coal for Company's use	4,017	06
Total for week	128.298	14
Previously this year	2,369.926	11
Total	2,498,225	05
To same time last year	1,818,725	07

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending August 5, 1871.

	1871. WEEK.	1871. YEAR.	1870. WEEK.	1870. YEAR.
By Railway	28,996 01	285,433 10	24,955 10	670,747 04
" Canal	599 09	5,906 14	480 15	10.276 18
Total	29.595 10	291,340 04	25,436 05	681,024 02

Decrease 1871, 389,683 18 tons.

Lehigh Canal Coal Trade.

Shipped for the week ending August 4, 1871.

	WEEK. Tons.	Cwt.	TOTAL. Tons.	Cwt.
Total from Mauch Chunk Region	8978	19	109871	19
" " Beaver Meadow "	3179	14	15928	14
" " Treackow "	567	04	7061	16
" " Mahanoy "	195	11	2677	04
" " Hazleton "	8217	09	49692	15
" " Upper Lehigh "	953	06	4566	15
" " Wyoming "	4857	07	57439	02
Total	26949	10	247168	05
Corresponding week last year	25370	18	325053	02
Increase	1578	12		
Decrease			77884	17

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for week ending August 5, 1871, previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt
Total Wyoming	16,748 13	286,407 14
" Hazleton	51,335 03	498,382 15
" Upper Lehigh	89 00	884 12
" Beaver Meadow	20,778 18	174,037 07
" Mahanoy	10,179 02	316 065 12
" Mauch Chunk	157 04	6,414 02
" Sullivan & Erie		173 05
Total Anthracite	99,288 00	1,282,365 07
Bituminous Coal from all sources	8,061 00	238,354 00
Total by rail and canal	107,349 00	1,520,719 07
Same time last year	78,415 14	2,349,667 06
Increase	28,933 06	
Decrease		828,947 19
Forwarded East from Mauch Chunk by rail	75,252 04	1,035,571 04
Same time last year	58,564 16	1,884,389 18
Increase	16,687 08	
Decrease		848,818 14

RECAPITULATION.

Forwarded East from Mauch Chunk by rail	75,252 04	1,035,571 04
To N. C. R. R., at Mount Carmel		127,309 01
Forwarded North from L. & B. Junction	11,395 19	2,967 13
To L. & S. R. R. at Packerton for rail	16 07	3,519 16
Delivered at M'h Chunk	50 07	591 09
Delivered on line of road above Mauch Chunk	10 05	5,842 10
Delivered above Mauch Chunk for use of L. V. R.R.	970 04	29,840 17
To L. & S. R. R., at Penn Hav., for railroad		94 10
Do. for canal	8,217 09	54,546 17
At M. Chunk for canal	3,375 05	22,061 10
Total Anthracite	99,288 00	1,282,365 07
Bituminous Coal	8,061 00	238,354 00
Total all kinds	107,349 00	1,520,719 07

This report includes all Bituminous Coal carried over the Lehigh Valley and P. & N. Y. Railroads from December 1st, 1870, to date.

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, August 5, 1871.

	Tons.	Cwt.
From Port Carbon		
" Pottsville		
" Schuylkill Haven	32,615	00
" Port Clinton	2,858	00
Total for week	35,473	00
Previously this year	465,779	03
Total	501,252	03
To same time last year	108,245	11

Shamokin Coal Trade.

For week ending August 5, 1871	13,141	03
Same time last year	8.990	03
Increase	4,151	00
Decrease		
Total amount shipped to date	374,475	09
Same time last year	235,142	02
Increase	139,333	07
Decrease		

Delaware, Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna and Western R. R. for week ending August 5, 1871.

	Week. Tons. Cwt.	Year. Tons. Cwt.
Shipped North	18,983 02	187 8 7 09
Shipped South	39,516 03	451,323 05
Total	58,499 05	639 130 14
For the corresponding time last year:		
Shipped North	16.734 16	425,379 14
Shipped South	30,248 15	1.054,919 06
Total	46.983 11	1,480,299 00
Increase	11,515 14	
Decrease		841,168 06

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Campany for the week ending Saturday, August 5, 1871.

	WEEK.	SEASON.
North	52,815 12	554 643 19
South	10,408 05	136,969 04
Total	63,223 17	691,340 03
Corresponding time in 1870:		
North	39 987 13	1,346,512 08
South	12,538 13	270,963 14
Total	52 526 06	1,617,496 02
Increase North	10,697 11	
Decrease South		
Total decrease		926,155 19

Delaware and Hudson Canal Company.

The following is a statement of Coal transported by the Delaware and Hudson Canal Co., for the week ending August 5, 1871.

	WEEK.	SEASON.
By Delaware and Hud. Canal,	34,859 00	330,798 00
By Railroad East,	9,626 00	150,995 00
" West,	4,139 00	44,388 00
" South,	10,409 00	136,697 00
TOTAL TONS,	59,033 00	722,878 00
For the same period last year.		
By Delaware and Hudson Canal	47,327 00	880,696 00
By Railroad East,	5551 00	248,346 00
" West,	1629 00	48,432 00
" South,	12538 00	270,954 00
TOTAL TONS,	67,045 00	1,428,428 00
Decrease	705,550 00	

Huntington and Broad Top R. R. Co.

For week ending Aug 5, 1871	3,662 tons.
Same time last year	5,382 "
Increase	
Decrease	1,770 "
Total amount shipped to date	210,947 "
Same time last year	185,230 "
Increase	25,717 "
Decrease	

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Aug. 5, and during the year 1871, compared with the corresponding period of 1870.

WEEK.

	To C. & O. Canal Tons. Cwt.	To B. & O. R.R. C. Tons. Cwt	Total. Tons Cwt.
1871	13,385 13	24,259 02	37,644 15
1870	11,935 19	14,233 11	26,169 10
Increase	1,449 14	10,025 11	11,475 05
Decrease			

YEAR.

1871	382,410 17	729,047 12	1,111,458 09
1870	295,366 05	489,578 17	784,945 02
Increase	87,044 12	239,468 15	326,513 07
Decrease			

Cumberland Branch

WEEK.

	To C. & O. Canal. Tons. Cwt.	To B. & O. R. R. Co. Tons Cwt.	Total. Tons. Cwt.
1871	4,073 12	1,269 14	5,343 06
1870	1,909 09	2,329 17	4,239 06
Increase	2,164 03		1,104 00
Decrease		1,060 03	

YEAR.

1871	109,125 05	44,695 02	153,820 07
1870	55,274 01	59,718 12	114,992 13
Increase	53,851 04		38,827 14
Decrease		15,023 10	

Big Lick Colliery.

For week ending Aug. 5, 1871	3,752 15
Same time last year	1,487 01
Increase	2,265 15
Decrease	
Total amount shipped to date	79,451 14
Same time last year	42,123 11
Increase	37,328 03
Decrease	

Lyken's Valley Colliery Coal Trade.

For week ending Aug. 5, 1871	2,051 10
Same time last year,	
Inc ease,	2,619 11
Decrease,	568 01
Total amount shipped to date,	51,161 19
Same time last year,	25,9-6 08
Increase,	26,255 11

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK, Aug. 11. R. A.	W. A.	AT PHILADELPHIA. Aug. 23. R. A.	W. A.
SCHUYLKILL.				
Lump	$— —	$— —	— —	— —
Steamer	6 00	— —	— —	4 50
Broken	6 00	— —	— —	— —
Egg	6 25 —	— —	5 00	— — 4 75
Stove	6 50 —	— —	5 00	— — 5 00
Chestnut	5 75 —	— —	— —	— —
Pea	— —	— —	— —	— —
LEHIGH				
Lump, (along side)	6 75	——	— —	— —
Broken	6 15	— —	— —	— —
Egg	6 00	— —	— —	— —
Stove	6 50	— —	— —	— —
Chestnut	5 50	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A. 5 50@7 00		— —	— —
New England	" —		— —	— —
Locust Mountain	W. A. 6 50		— —	— —
Honey Brook, Le'h	W.A. 5 00@6 25		— —	— —
Spring Mountain	" " 5 00@6 25		— —	— —
Sugar Creek	" " 5 00@6 25		— —	— —
Sugar Loaf	" " 5 00@6 25		— —	— —
Old Comp'y's.	" " 5 00@6 25		— —	— —
Cross Creek	" " 5 00@6 25		— —	— —
Room Run	" " 5 00@6 25		— —	— —
Girardville	" " —		— —	— —
McMichael	" " — —		— —	— —
Shamokin	" " 5 25		— —	— —
Lykens Valley	" " 5 75		— —	— —
Broad Top	" " 5 25		— —	— —
Hill & Harris	" " — —		— —	— —
Henry Clay	" " — —		— —	— —
Powelton	" 5 25		— —	— —

*Dealers in these coals may be found in our advertising columns.

Line Prices for Coal August, 1871,

	Lump	Broken	Egg	Stove	Ches't
At Mauch Chunk	4.50	4.00	4.00	4.25	3.50
" Wilkesbarre,	3 75	3.75	3.75	4.00	3.25

Company Coals.

August, 1871.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton E. Port	4 80	4 90	5 10	5 50	5 75	4 75
*Pittston at Newburgh	4 80	4 80	5 00	5 10	5 40	4 60
*Lackawana at Rond't	4 70	4 90	5 15	5 40	5 75	4 85
Wilk'b're at Hoboken	4 65	4 65	5 00	5 25	5 75	4 75
Old Co. Lehigh at PtJohn'n	6 25	— —	5 65	$ 50	6 00	5 00
Lehigh at Eliz. Port	6 25	— —	5 65	$ 50	6 00	5 00

For freights to different points see "Freights."
* To contractors.

Prices at Baltimore—August, 1871.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 25@5 50
Pittston and Plymouth, do	5 25@5 40
Shamokin Red or White Ash, do	5 25@5 40
Lykens Valley Red Ash, do	— —@5 80
Zerba Valley	— —@— —
Treverton	— —@— —
By retail, all kinds per ton of 2240 lbs.	7 00@7 50
Georges Creek & Cumberland f. o. b. at Locust Point for cargoes	— —@4 75
Fairmont and Clarksburg gas, f. o. b. at L. Point	6 00@6 50

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein...f.o.b. at Phila	$ —
Lemon " " "	—
Cumberland Vein Coal	—
Consolidation Coal Co.'s on board N. Y.	6 75
Maryland Coal Co. " "	6 75

Prices at Georget'n, D.C., & Alexandria, Va.

August, 1871.

George's Creek and Cumberland f. o. b. for shipping...$4 50@4 60.

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$5 50@5 75
Lykens Valley	6 00@6 25
Shamokin Red or White Ash	5 50@6 00
Treverton and Zerba Valley	— —@— —

Prices of Gas Coals.

August, 1871.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

Duty, $1 25, gold	Coarse	Slack.
Block House	$1 75@1 75	
Gowrie	1 75@1 75	

Corrected by Bird, Perkins & Job, 86 South street.

	Coarse.	Culm of Coal.
Pictou	$2 25	@1 25
Sydney	2 25	@— 80
Lingan	1 60	@— 80
Little Glace Bay	1 60	@1 00
Caledonia	1 60	@— 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal. 25 per cent. ad valorem on the Culm of Coal.

AMERICAN.

	Currency.
Westmoreland	$7 00@— —
Fairmount Gas Coal Co. of N. Y.	7 00@— —
Despard Coal Co.	7 00@— —
Penn	7 00@— —
Newburg Orrel Gas	— —@— —
West Fairmount Gas Coal	7 00@— —

AT PHILADELPHIA.

Powelton	$6 75

TO NEW YORK.

Provincial.	
Sidney	$ —
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—

Freights.—August, 1871

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore.	Anthracite. From Philada.	Anthracite. From East Port, Port Johnson, and Hoboken.	Anthracite. From Newburg...	Anthracite. From Rondout...
Amesbury			$2 50	$1 75		
Bangor	$2 75		2 30	1 75		
Bath	2 75	2 65	2 30	1 75		
Boston	2 60	2 60	2 25	2 00	180	1 80
Bridgeport	2 25	2 30	1 80	1 00	1 10	1 25
Bristol		2 60	2 00	1 40		1 55
Cambridgeport			2 75	2 00		
Derby			2 00	1 20		
Dighton	2 30	2 35	2 30	— —		
East Cambridge			2 35	2 00		
Fall River	2 25	2 30	2 25	1 40	1 40	
Hackensack			1 75	90		
Hartford	2 75	3 00	2 30	1 50		
Jersey City		2 00	1 40	50	70	
Middletown			2 25	1 25		
Mystic			— —	1 10		
New Bedford	2 70	2 35	2 00	1 40		
Newburyport	2 75		2 40	1 60		
New Haven	2 25	2 30	1 90	1 00	1 10	1 35
New London	2 25	2 30	1 76	1 15		2 20
Newport			2 00	1 40		1 25
New York	2 00	1 90	1 35	55	70	1 40
Norwalk		2 30	1 80	1 00	1 10	65
Norwich	2 25	2 30	2 00	1 20	1 40	
Pawtucket	2 70	2 50	2 30	1 40		1 50
Portland	2 50	2 60	2 30	1 85		1 65
Portsmouth, N.H	2 75	2 75	1 45	1 80		2 00
Providence	2 25	2 30	2 00	1 40	1 50	1 50
Rockport			2 10			
Saco	2 75		2 25	1 75		
Sag Harbor			1 70	1 20		
Salem	2 60	2 65	2 35	1 80		
Stamford			2 00	1 00	1 10	
Stonington			2 00	1 25	1 20	
Taunton			2 30	1 50		1 40
Warren			— —	1 30		
Washington			1 25			
TO RIVER PORTS.						
Albany		80			55	
Catskill		70			50	
Cocksackie		70			50	
Coeyman's		70			65	
Cold Spring	2 20	70			30	
Fishkill		70	1 60		30	
Haverstraw					60	
Hudson	2 20	2 25			40	
New York					60	
Nyack			1 75		30	
Poughkeepsie					30	
Rhinebeck						
Rondout					75	
Saugerties			1 60		40	
Sing Sing					75	
Stuyvesant					75	
Tarrytown					75	
Troy					55	
West Point			1 75			
Yonkers			1		60	

Prices of Foreign Coals.

August, 1871.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" Cannel	10 50@12 00
" House "	— —@16 00
" Orrel	12 00@14 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@17 50
" Cannel, "	18 00@20 00

Per ton 2,000 lbs. delivered.

Foreign and Provincial Freights.

August, 1871.

Foreign.	
Newcastle and Ports on Tyne, per keel of 21 1-5 tons	£14 00@£16 00
Liverpool, 5 per cent primage	15s @15 ton.

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption	$1 95
For reshipment	1 85

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 85
C. R. R., N. J., Phillipsburgh to Elizabethport	1 26
Shipping expenses at Elizabethport	75
Wharfage	10
Total	$2 46

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 85
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 26
Shipping expenses	25
Wharfage	10
Total	$2 46

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Phillipsburgh	$ 85
Morris & Essex R. R. Phillipsburgh to Hoboken	1 25
Shipping expenses	20
Wharfage	16
Total	$2 46

TO SOUTH AMBOY.

L. V. R. R.	85
E. & D. R. R.	1 21
Cam. & Am. R. R.	
Shipping Expenses,	35
Total	$2 41

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	90
C. RR. of N. J. Phillipsburgh to Elizabethport	126
Shipping expenses	25
Wharfage	10
Total	$ 2 51

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven..Toll..$1.25	Freight..90c....$2 15
" Port Carbon	
" Port Clinton..... " 1.18	" 85c.... 2 02
Drawback 15 cents during August.	

TO NEW YORK.

From Schuylkill Haven ....Toll..1 10 Freight..$1 85..$2 95

The Rates of Toll on Lump and Steamer Coal will be ten per cent less than the above rates. The charge will be per ton of 2240 lbs. No charge less than Forty Cents per ton will be made for any distance. A drawback of thirty cents is allowed on all coal passing Fairmount Locks used at Philadelphia and vicinity.

Via Lehigh Canal.

TO PHILADELPHIA

Lehigh Canal	$ 76
Freight and towage	1 10
Total	$1 86

TO NEW YORK.

Lehigh Canal	$1 48
Morris Canal	
Freight	
Towing	208
Total	$2 56

TO JERSEY CITY.

Lehigh Canal	$ 48
Morris Canal	
Freight	2 06
For re-shipment	2 54

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 76
Delaware Division Canal	38
Delaware and Raritan Canal	
Freight	1 25
Towage	20
Total	$2 59

TO NEW BRUNSWICK.

Lehigh Canal	$ 76
Delaware Division Canal	
Delaware and Raritan Canal	38
Freight	1 25
Total	$2 39

MARKET REVIEW.

FOR THE WEEK ENDING AUGUST 12, 1871.

IRON.—There has been an improved demand for Scotch Pig, and, with a moderate supply, prices are steady at the advance previously noted; sales have been made of 650 tons Glengarnock at $33@$34; 400 do. Eglinton, $32; 75 do., Summerlee, $34; 100 do. Coltness, $31, gold; and 300 do. Gartsherrie, on private terms. American continues in active request, and prices are a trifle firmer—it is believed that the supply of the year will not be equal to the demand; 100 tons No. 1 sold at $36; 100 do. No. 2, $34; and 1500 do. No. 2, ex GLENDON, future delivery, on private terms. New Rails have been in active

request; and we notice sales of 9500 tons, 56 lb. English, here and to arrive, part $57, gold. Store prices of Refined Bar continue unchanged, and the demand is still light, buyers apparently not being moved by the advance abroad, which extinguishes all margin for profit, or the high prices demanded by our own makers. The importers and jobbers will hold a meeting to-day, and probably advance Bar $2 50@$5 per ton. One hundred barrels Russia Sheet, sold on private terms. BURDEN'S refined Bar is quoted in the circular of WETMORE & Co. (their agents), for August, precisely the same as for May—including "BURDEN'S best." and H. B. & S. as follows: ordinary sizes, Round and Square, ⅜ to 2 inch, and Flats 1¼ x ¼ to 4½ x 1 inch, $105—extra sizes Round and Square, ¼ to 2⅜ inch, $135 to $110; 2½ to 4 inch, $115 to $125; extra sizes, ½ x ¼ to 3 to 6 x 1½ to 2 inch, $145@$150; 3 to 6 x 2¼ to 2½ to 8 x 1⅜, to 1½ inch, $115@$130; and Horse ⅜ x ⅜ to 1 x ⅝ inch, $105—H. B. & S., Round and Square and Flats, $80; extra sizes Round and Square, ¼ to 3 inch, $25 less than Best. H. B. S. Flats, 1 to 6 x ¼@5-16 to 1¼ x 1⅛ to 6 x 2 inch, are quoted $85, and 3 to 6 x 2¼ to 3 inch, $90 ℔ ton, net cash.

LEAD.—Pig remains dull, and prices are without improvement—100 tons Spanish sold on private terms; and 25 do. Domestic brought $6 05 ℔ 100 lb., gold. Bar 9¼c., Sheet and Pipe, 10¼c., and Tin-lined Pipe, 15c.—all less 10 per cent. to the Trade.

COPPER.—The Manufactures of Copper and Yellow Metal are steady at our quoted rates. The business in Ingot is large, chiefly on speculation for future delivery, and prices are again a shade higher; the sales are about 150,000 lb. Lake, on the spot, at 22⅛c.@22¾c., and 1,000,000 for delivery from September to December, mostly at 23c.

SPELTER.—The demand is very small, and we have only to notice sales of 10 tons Silesian at 6¼c., gold, and 15 do. Missouri Zinc Co., selected, 9¼c., currency.

STEEL.—If we only noticed this article when changes occurred, we should not mention it more than once or twice a year. Store prices continue uniform, the ordinary fluctuations in gold having no influence on prices.

TIN.—Pig has moved more freely at about the prices previously current; sales have been made of 1800 Slabs Straits and Malacca, on private terms; 2@300 do. Straits, 36¼c.@36½c.; and 15 tons English, 35½c.@35¾c., all gold. The sale at Batavia, 7th inst., went off at 85¼@85½ florins, against 75⅞ florins realized at the sale same time last year. Plates continue in moderate demand at steady and firm prices, the business being chiefly in trade parcles; sales have been made of 100 boxes Assorted Charcoal Tin at $8 75 for I. C.; 500 do. hf. extra, $8 62½ for I. C.; 200 do. Coke Tin, 14 by 20, $8 12½; 750 do. Charcoal Terne, $8 12½@$8 25, all gold; and 500 do., on private terms.

ZINC.—Mosselmann Sheet is steady at 9c., currency, for No. 9, from store. Last sales from agents' hands, to arrive, 7¾c., less 4 ℔ cent., gold.; Am. Dry, 6½c.@7c.; French, 9½c.@10c.; Manganese, "Nova Scotia," 4¼c.@5c.

METALS.

NEW YORK, Aug. 9, 1871.

IRON.—Duty: Bars, 1 to 1¼ cents ℔ lb; Railroad, 70 cents ℔ 100 lbs.; Boiler and Plate, 1¼ cents ℔ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ℔ lb; Pig, $7 ℔ ton; Polished Sheet, 3 cts. ℔ lb; Galvanized 2½; Scrap Cast, $6; Wrought, $8 per ton.

	Store Prices.
Pig, Scotch No. 1, ℔ ton	31 50@36 00
Pig, American, No. 1	35 00@36 00
Pig, American, No. 2	33 00@34 00
Pig, American, Forge	31 00@32 00
Bar Refined, English and American	73 00@74 00
Bar Swedes, assorted sizes (gold)	85 00@100 00
	Store Prices, Cash.
Bar, Swedes, ord'y sizes	102 50@115 00
Bar, Refined, ord'y sizes	75 00@ — —
Bar, Refined, ¼ @ 5-16 inch	82 50@ — —
Bar, Common	70 00@ 72 50
Scroll	95 00@125 00
Ovals and half-round	95 00@120 00
Band	90 00@ 95 —
Horse Shoe	95 00@100 00
Rods, ⅜ to 3-16 inch	82 50@120 —
Hoop	100 00@140 00
Nail rod	— —@6¾ —
Sheet, Russia, as to assortment (gold)	— —@12¾
Sheet, Single, B, and T. Common	—4¼@— 5¾
Sheet, D. an I T. Charcoal	—5¾@—6¼
Sheet, Galv'd, Nos. 14 to 26 ..... 37½ ct. dis.	12@14c ℔
" " Nos. 27, 28, and 29 ..... 30 ct. dis.	15@18c ℔
Rails, English (gold), ℔ ton	— — @57 00
Rails, American, at Works in Pa	59 00 @71 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ℔ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 3½ cents ℔ lb, and 10 ℔ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ℔ lb	— 15 @— 18
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 10 @— 17
English Machinery	— 11 @— 13
English German (2d and 1st quality)	— 10½@— 12
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— 15 @— 16
American, Spring, do.	— 9 @— 11
American Machinery, do.	— 10 @— 11
American German, do.	— 9 @— 11

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ℔ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ℔ lb	— @— 30
Copper Bolts	— @— 32
Copper Braziers, 16oz. and over	— @— 32
Copper Nails	36 @— 38
Copper, Old Sheathing, &c. mixed lots	— @— 19
Copper, old, for chemical purposes, 14@16 oz	20 @— 21
Copper, American Ingot	22⅝@— 22¾
Yellow Metal, New Sheathing & Bronze	— @— 22
Yellow Metal Bolts	24 @— —
Yellow Metal Nails	— @— 22

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb; Pipe and Sheet, 2¼ cents ℔ lb.

Galena, ℔ 100 lbs	$— — @— —
Spanish (gold)	6 12½@6 15
German, do.	6 12½@6 15
English, do.	6 15 @6 50
Bar (net)	9 25 @ —
Pipe (net)	— — @10 25
Sheet	— — @10 25

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ℔ lb.

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (gold) p. 100 lb.	5 75 @ 6 12½
Plates, Domestic p. lb.	— 7 @— 11

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent.; Roofing 25. ad val.

	Gold ℔ lb.
Banca	40½@41
Straits	36¼@36½
English	35¼@35½

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ℔ box	$8 62½@9 00	$10 25 @10 75
I.C. Coke	7 50 @8 50	9 00 @10 00
Coke Terne	6 25 @7 50	7 25 @ 9 00
Charcoal Terne	8 00 @8 50	9 50 @ 10 00

ZINC—Duty: Pig or Block, $1 50 ℔ 100 lb.; Sheet, 2½cts. ℔ lb.

Sheet, No. 9 Foreign ℔ lb. — @— — 9

Mining Stocks.

NEW YORK, August 10, 1871.

The only changes in the quotations of the following list, furnished by the "Mining Stock Board," as compared with the report in our last, is a slight advance in Central Gold, and a falling off in Smith & Parmelee. No sales.

GOLD STOCKS.

	BID.	ASKED.
American Flag	10	—
Bates & Baxter	25	—
Benton	—	10
Black Hawk	35	—
Central Gold	—	9
Cons Gregory	30	40
Grass Valley	7	—
Gunnell	15	—
Holman	—	—
La Crosse	19	—
Liberty	—	—
Maripo-a prf	—	—
Montana	—	—
Rocky Mount	—	5
Quartz Hill	—	30
Smith & Parmlee	20	40
N. Y. & Eldorado	—	—

Petroleum is weaker and inactive, no sales having occurred during the week. We quote nominally as follows:

PETROLEUM STOCKS.

	BID.	ASKED.
Bennehoff Run	20	—
Bergen Coal and Oil	15	—
Bliven Oil	20	—
Blood Farm	—	—
Breevoort	30	50
Buchanan Farm	40	—
Central	—	—
Clinton	—	—
Home	150	—
National	—	—
New York & Allegheny	75	—
Northern Light	30	—
Phillips Pet	—	15
Pithole Creek	—	100
Rathbone Oil	—	—
Rynd Farm	33	—
Second National	—	—
Sherman & B	—	—
Tarr Farm	—	—
United Petroleum Farms	28	—
United States	—	65
Hoffman	—	—

San Francisco Stock Market.

"By Telegraph."

Our report from the San Francisco Mining Stock Board is dated August 9th. The market during the week has been irregular, with a downward tendency. Belcher seems to be the only noteworthy exception, it having advanced $28 per share since our last report. Gould & Curry is weak and inactive. Sales of Hale & Norcross were effected on the 4th inst. at $100, and Ophir on the same date sold for $10¾. Annexed is the full report of the Board:

Savage	55
Yellow Jacket	48½
Kentuck	112
Chollar Potosi	29
Gould & Curry	No sales
Belcher	278
Imperial	30
Amador	No Sales
Crown Point	No Sales
Hale & Norcross	—

Weekly Slate Trade Report—Hydeville.

ROOFING SLATE.

Week ending Aug. 5, 1871.

NAME OF COMPANY.	WEEK.	PREVIOUSLY.	TOTAL FOR YEAR.
Eagle Slate Co	70	3245	3315
Western Vermont Slate Co.	....	314	314
Blue Slate Co	40	1630	1670
The Evergreen Slate Co	175	3229	3404
Forest Mining Slate Co	....	414	414
West Castleton Slate Co	....	....	....
E. D. Billings	50	859	909
R. M. Copeland	....	404	404

Ransome Stone.

THE rapidity and ease with which blocks of any form, and the sizes of which are limited only by the means available for handling them, can be produced upon the spot where they are to be employed, are advantages sufficiently great to warrant their adoption. And when, in addition, it is remembered that the materials which form the base of the Ransome stone exist in most instances in embarrassing quantities upon the site where hydraulic works are carried on, and that these, by the combination of other elements, are converted almost immediately into a stone, the strength of which is surpassed only in a small degree by granite, it will be admitted the advantages obtained are almost incalculable. This application of Mr. RANSOME'S process has been suggested by Mr. BUTLER for two reasons—the first, to provide a cheap and thoroughly efficient substitute for stone for hydraulic works; the second, to render unnecessary the construction of false works, coffer dams, &c., and to avoid the employment of iron cylinders and caissons, now of necessity so extensively used.

In order to obtain perfectly reliable data as to the powers of resistance of Mr. RANSOMES'S stone, a valuable and exhaustive series of experiments was recently carried out, and the result of these experiments showed that the average power of the stone to resist a crushing force was 3.19 tons to the square inch. It should, however, in justice be remarked that this average was reduced by the fact that some of the stone blocks tested were composed of materials which necessarily gave a comparatively low result, and that the average strength of the stone manufactured in the ordinary manner, gave an ultimate strength of four tons per inch, which may be assumed as the average strength of the stone.

Compared with some of the best natural constructive materials, the strength of the Ransome stone stands thus:

Portland stone, 2630*l.* per square inch.
Bramley Fall, 5120 lbs. per square inch.
The Ransome stone, 8960 lbs. per square inch.

It will thus be seen that the Ransome stone is, so far as strength is concerned, one of the most suitable of all building materials, and being perfectly homogeneous, it is thoroughly reliable. With regard to its durability, it is sufficient to point out that its constituent elements, and the manner in which the concretion of the entire mass is effected, guarantee for it a hardness and durability scarcely to be met with in any other material, whilst its uniformity of color and texture render it also peculiarly suitable for the new purposes for which it is now being applied.

In practice, the materials forming the stone will be moulded *in situ* into blocks, either solid or cellular, of the required shape and dimensions. The cellular blocks form, however, the special peculiarity of this system. For bridge piers and abutments the blocks may be rectangular or circular, for dock and river walls they may be square or hexagonal—in fact, any required shape may be given them. If found advisable, they may be stiffened internally with iron braces, but this would be seldom necessary, as the strength of the material will be found sufficient, unless in very exceptional cases. For convenience in sinking the blocks (an operation which is precisely similar to that employed in sinking iron cylinders), the lower edge of the bottom length would be chamfered, and, when necessary, shod with iron. The horizontal joints would be made preferably with alternate projections and depressions in the sides of the blocks, and the vertical joints are made good with timbers halved into each block. But these joints may be effected in a variety of ways, which need not be specified here.

What is specially urged for this system is, that it is a simple and reliable utilization of material thoroughly adapted for the purpose, that it provides a cheap and efficient substitute for the present costly means of sinking foundations, and it is confidently believed that by its application a great revolution will be effected in the construction of hydraulic works.

It need scarcely be explained that, in nearly all cases, the stone blocks, or caissons, form their own coffer-dams, whilst in those exceptional instances, where temporary works are required, their extent and cost would be reduced by the new system.

It is also evident that there are few circumstances under which the process described, or modifications of it, would be inapplicable, whilst its cost, even under the least favorable condition reduced to half that of the existing modes of construction, would, in situations where skilled labor is scarce and materials and the means of transit costly, be further reduced to a far larger extent.—*Engineering.*

DEPARTMENT OF POPULAR SCIENCE.

Darwin's Hypothesis of the Origin of Species.

II.

In the preceding article I gave a statement of the general classification of the animal kingdom, and of the position occupied in that classification by species.

If, instead of proceeding by subdivision of greater into smaller groups, we begin with individuals, we find groups of them which are essentially alike, though not exactly so, which tend to reproduce their like, and which do not freely breed together, group with group; or, if they are crossed, their offspring, called hybrids, are infertile. These groups we call species; and it has been generally held that, since each species perpetuates itself by reproduction, so each species must have descended from a specially-created ancestral pair.

Within the limits of each species, however, we know that individuals vary considerably, and that these variations may be to some extent made permanent. Thus we have varieties, breeds, and races which are not considered as true species, because they breed freely with one another, and because the differences among them are not usually so great as the differences among species. We have, for instance, many breeds of horses, but we recognize them all easily as horses, and if we desire to maintain the peculiarities of each, we must be careful to allow no intermixture with a different race. All our domesticated animals are varieties, of which the wild species are sometimes known and sometimes unknown.

The science of breeding is yet comparatively in its infancy, but it is astonishing already to view the triumphs which have been achieved by gardeners with flowers and fruits, and by stock-fanciers with beasts and birds. In some instances, as, for example, in the case of pigeons, forms have been produced which differed so widely that if they occurred in a state of nature, *i. e.*, wild, they would be unhesitatingly ranked as species, but for one reason—they would breed with one another, lose their peculiar characteristics, and perhaps revert to the forms and colors of the ancestral species. We see, then, that the only strong distinction between species is based on their remaining separate and not breeding together. If they do breed together, the hybrids, it is supposed, being infertile, die out.

Now Mr. DARWIN holds that species have been produced in nature, not by the creation of a pair of progenitors for each species, but by a process analogous to that of the production of varieties by human selection, and this process he calls natural selection. Other philosophers before him have held to the notion of gradual development of species, as opposed to their special creation; but their propositions have been mostly but speculations. Mr. DARWIN'S is a rational hypothesis.

Let me say here, that the question of a Divine creative power does not enter into this discussion. We believe that God creates every one of us, yet we know that we owe our birth to the operation of natural laws. The question whether God created the first lion and the first tiger by a direct interposition of His power, making them out of nothing, or whether both of them descended from a common ancestor of the genus *Felis*, is one for our reason to ask, and, if possible, to answer. The best hypothesis on the subject is that which will best explain the facts observed.

Mr. DARWIN'S reasoning is admirably set forth in a popular form by Mr. ALFRED WALLACE, himself an eminent naturalist, and to some extent an independent author of the same hypothesis, in an essay on "Creation by Law," originally published in the London *Quarterly Journal of Science*, in 1867, and recently republished, with additions, in a book called "Contributions to the Theory of Natural Selection." I shall partly follow his argument.

The law of natural selection is deduced from the following facts:

I. All plants and animals tend to increase in geometrical ratio. In the case of an annual plant, producing but two seedlings before dying, if each of these lived to produce two in the next year, and so on, there would be more than 1,000,000 plants living in the 21st year, descended from the original single individual. Even if we take the slowest breeders among animals, the increase is remarkable. Thus, we may assume that a pair of elephants live 100 years, and produce six young ones at intervals of ten years, from their 30th to their 90th year. Yet if a pair of elephants had come to this country in the year 900, and they and their posterity had lived and flourished, even at this slow rate, until now, there would be to-day more elephants in North America than there are human beings! Here is the calculation. At the end of 100 years, there would be eight elephants living, namely, six of the first generation, and two of the second—grandchildren, sprung from the two oldest children—the grandparents being dead. By toilsome calculation, assuming the births to take place at regular intervals of ten years, beginning with the fortieth year of the life of the parent, we obtain this table:

At the end of	100	years—Descendants	living,	8
" "	200	"	"	50
" "	300	"	"	289
" "	400	"	"	1,678
" "	500	"	"	9,738
" "	600	"	"	56,283
" "	700	"	"	326,441
" "	800	"	"	1,893,360
" "	900	"	"	10,981,488
" "	1000	"	"	63,692,620

If we take a pair of birds, grant them two young ones per annum for four years, and the result will be in 15 years, a total of 26,487,658 born, and (supposing them to die after four years), 26,150,752 would be living in the fifteenth year. (The foregoing figures as to elephants and birds differ considerably from those of Mr. DARWIN, on elephants, and Mr. WALLACE, on birds. The latter author gives two widely varying results, and both erroneous, according to his statement of the problem. But this does not affect the argument.)

These startling figures are corroborated by observed facts as to the multiplication of species, both of plants and animals, where opportunity has been favorable. For instance, domestic animals running wild; the marvellous increase of flocks and herds in Australia and South America; of wild horses in America; of certain plants in Asia; of the Canada thistle in this country, etc.

R. W. R.

New Publications.

FOUR YEARS AT YALE. BY A GRADUATE OF '69. New Haven, Conn.: CHARLES C. CHATFIELD & CO. 1871.

THIS very handsomely printed and bound volume of seven hundred pages is intended to give a view of the student life at Yale, as seen by the students themselves, and to dispel the erroneous and absurd ideas of college life entertained by many intelligent people who have not passed through it themselves.

The style of the book is very good, chiefly that of an easy narrative, so that one feels almost as if he were passing through the scenes described. The accounts of the boat-races and of the troubles between the students and "townies" will probably be found of most interest to the general reader. Some facts and incidents are enlarged upon which seem of but little interest to one who has never been connected with the college; but, as the book will be read and prized mainly by the alumni of Yale, we suppose that the author has exercised good judgment in the matter. The introductory chapter is historical and explanatory, after which the main topics treated are, the society system, the student life, and the official curriculum. In the concluding chapter, the author, whose name is withheld, gives his personal views upon many subjects connected with college life. Expressions of opinion are not found in the preceding chapters.

We have also received from the same publishers a very neat copy of WALLACE'S pamphlet on NATURAL SELECTION, which has already been noticed in our columns; and also a pamphlet of nearly seventy pages on the DURATION AND NATURE OF FUTURE PUNISHMENT, by HENRY CONSTABLE, A. M., Prebendary of Cork.

THE VALEDICTORY POEM AND ORATION delivered before the Class of 1871 of Yale College, also published by C. Chatfield & Co., reflects credit upon the authors and publishers.

The American Association for the Advancement of Science.

THE twentieth annual meeting of this association will commence on the 16th of this month, at Indianapolis. Professor ASA GRAY, of Cambridge, is the President of this meeting, and the regular address of the retiring President will be delivered by Dr. T. STERRY HUNT. The State officers have placed the committee room at the State Capitol at the disposal of the Local Committee, and the Senate chamber and the Hall of Representatives will be occupied by the Sections A and B. Dr. HUNT will also respond to the speech of GOV. BAKER, of Indiana.

A large number of places of interest in the neighborhood of Indianapolis are named in the circular issued by the Local Committee, and an invitation has been extended by the citizens of Terre Haute to the members of the Association to visit their city. The prospects for a full and interesting meeting seem excellent.

The Inspection of Coal Mines.

STELLARTON, July 23, 1871.

TO THE EDITOR—SIR: The adoption of Mr. ECKLEY B. COXE'S suggestions, I think, would improve the mining law, as the inspectors are more negligent of their duty than the operators or workmen.

I speak from experience of the negligence of the inspectors. Compelling them to visit the whole of the mines and working places, and see for themselves the condition of every place, and report accordingly, would prevent many fatal accidents. The inspectors do not make themselves acquainted with the condition of the working places of the mines as they ought to do, and consequently many of the great disasters in mines have taken place. I know of mines that the inspector reported in first-rate working order when the main airway has not been large enough to admit a man to get through it. Men have been burnt in the same mines and all the blame put on the workmen for having been burnt, instead of on the master and inspector for not having proper airways and ventilation. It would have been better for the mining population never to have had a mining law with inspectors appointed, as accidents would be much less frequent. I think if you take the record of accidents since the appointment of inspectors in the United States, you will find them much greater in proportion to the numbers employed, and tons of coal mined than previous to the appointment of inspectors. This would tend to show that the law fails to reach its object; and, therefore, any amendment compelling the operator and inspectors to do their duty in fulfilling the law, would result in good to all parties. Entering upon record the visits of the inspectors, and the condition of every working place of the mines, and leaving the records open for inspection, after each visit, by a stated number of practical miners to see that the record is correct, and, if so, place their names on the record as a proper statement of affairs. If they find that the record is not correct, they should report to a Justice of the Peace the result of their investigations, with a view to punish the inspectors for false reports of the mine and with intent to destroy life and property. I think the above would make inspectors more faithful in their duty, and would prevent many accidents that now take place in every mine. I could name many accidents that have occurred on account of the inspector's negligence of duty.

COAL MINER.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
WILLARD P. WARD, M. E.,
Editors.

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The Use of Steam on Passenger Boats.

IN another column will be found a contribution from an experienced engineer, who was engaged in the building and erection of engines in boats at an early period in the history of steam navigation in this country. His remarks regarding the explosion of the boiler of the "Westfield" are straightforward, honest and to the point. The adoption of the ideas therein advocated would, without doubt, prevent many more accidents than the more modern ones of unequal expansion and contraction, low water, etc.

There is, however, one point to which he alludes, which might, with great propriety, have been made still more prominent. He says, that in the early days of steam navigation, the arrangements for the supply of feed water to the boiler were such that not more than four or five pounds of steam could be carried, without at once relieving the pressure entirely. He also briefly mentions the fact that it would be possible, even in this fast age, to run a boat by steam without carrying a pressure that could do any harm, even in case the boiler did burst. Economy of fuel demands the use of steam under a higher pressure than ought to be used on passenger boats, yet, with a little more coal, we believe that the boat could be propelled through the water just as rapidly as at present, and even more safely than if she were driven by sails.

It would seem that any passenger would be willing to pay a trifle more fare, if necessary, to reimburse the owners of the vessel for their extra expenditure of coal, in order to secure his safety on the trip, but we do not think that the matter should be put in such a way. Competition between rival boats is often pretty sharp, and a few dollars reduction in the coal bill often becomes an important item. The way to reach the root of the difficulty is through the adoption and enforcement of good laws. A commission of good engineers should be appointed to determine a maximum pressure to be allowed on boats plying in our harbor and upon our rivers, and any engineer found with a higher pressure upon his boiler than the one prescribed by law, should be severely punished. An inspection of the boilers should also be made from time to time, but it seems as if an inspection alone did not afford sufficient protection to the public. An inspector may honestly think that a boiler is capable of resisting a pressure of a hundred pounds to the inch, but if it is discovered, when the boat has five hundred passengers on board, that he was mistaken, the consequences are too severe upon the innocent passengers and too mild upon the mistaken inspector.

We do not wish to be understood as recommending that every boat should be allowed to carry as much as the maximum pressure of twenty or twenty-five pounds, which would probably be adopted by the experts, but simply that no boat should be allowed to carry more; and boilers and engines should be built in conformity with this rule. An old boiler need not necessarily be condemned because it cannot stand the maximum pressure allowed by law. It may be a perfectly safe boiler, when used at a lower pressure, and the engineer should be punished if he exceeded the pressure allowed him by a competent inspector. Even if the boiler exploded, at a pressure under the maximum allowed by law for passenger boats, no very great damage could be done, and the engineer would not deserve anything like as severe punishment as the man who, no matter how good his boiler, exceeded the maximum pressure, which the law decided could not be passed without danger to life and limb.

EDITORIAL CORRESPONDENCE.

The Utah Mining Industry.

SALT LAKE CITY, July 22, 1871.

THE former rural quiet and cleanliness of the Mormon metropolis is sadly disturbed by the irruption of railroads, civilization and Gentiles. The hotels and sidewalks are crowded, saloons, assay offices, and lawyers' signs have sprung up everywhere with magical rapidity; piles of "bullion" bars, sacks of ore, and heaps of "specimens" attract the eye on every side; and plurality of claims has become the leading topic of conversation, instead of the plurality of wives. The Mormons themselves, though not exactly taking the lead in mining matters, are dabbling in them more or less; and if I may judge from some transactions which have come to my knowledge, the Saints have proved themselves as well acquainted as any sinners with the processes of prospecting, locating, salting and selling—in short, with all the tricks of the trade.

There is perhaps not so much excitement here as there has been in many new mining districts on far less foundation; the cause being, that there is little opportunity for persons without capital to engage in profitable enterprises. But the owners of claims hold them at enormous figures—a sure indication that, in a quiet way, the thing is overdone, whatever may be the actual basis.

Many new districts have been organized and prospected within the past year; and some of them are regularly shipping ore. A few mines, and among these especially the celebrated "Emma," have, thus far, furnished the principal basis of actual business, as well as the stimulus for sanguine operations. I shall try in another letter to give some account of these. At present, I propose to speak generally of the advantages of this Territory as a mining field, under existing circumstances.

First among the advantages of the situation must be reckoned the presence of a large agricultural population in the Territory. Utah will not have to import food, to supply its mining population; and this secures reasonable prices of supplies, and abundance of labor. The stories told about the cheapness of mining labor here are, however, exaggerated. The Mormons take from one another, it is true, very low wages. The standard is annually fixed, I am informed, by the church authorities; and I believe it is, this year, $1 50 per day. But they take all they can get from Gentile employers, and, moreover, few of them will work as miners; so the wages of this class of labor are $2 50 to $3 50 per day, even in the districts nearest to Salt Lake City. The prices paid for hauling ore, on the other hand, are very reasonable, considering the distances. I presume most of the teamsters are Mormons.

Another advantage is the facility of railway transportation for ore and base bullion, from Salt Lake to the East and West. In this respect, it is true, the miners and smelters are dependent upon the railway companies. A few weeks ago, all shipments of ore were paralyzed by a new and enhanced schedule of freights. Only the Emma Company, which had a contract with the railway, at low rates (running till next September, I believe), was able to go on. The rates have since been reduced, though not to the former point. At present, I am told, they are $18 per ton for ore and $20 for bullion, from Salt Lake to Omaha. But aside from these fluctuations, it is evident, that without the railroads, the mines of Utah would not have been successfully developed. Even for those ores which are smelted in the Territory, most of the charcoal is brought by rail from Truckee, in the Sierra Nevada (though a considerable amount is burned in the Wasatch mountains, and in piñon districts further south. The Truckee charcoal can be had here in large quantities at twenty-five cents per bushel; the Utah charcoal costs twenty-two cents, but is frequently inferior in quality, while the supply is precarious. This price is far higher than it should be; but the fact is, that the charcoal-burners here will abandon the business unless they can make as much money as other folks.

Again, the character of the ores in the Utah districts is such that they can be either shipped at once to foreign reduction works, or smelted into argentiferous lead here, and shipped in that form, or, finally, both reduced and separated in the Territory. Some of the mines in the western range furnish milling ores, which are treated by the Washoe system. The majority, however, contain galena, carbonate of lead, with gangue of ferruginous dolomite, and admixtures of antimony and arsenic.

If we inquire, however, how these favorable conditions are utilized, we find much to criticise and lament. The metallurgical industry here is conducted in a sadly careless and ignorant manner. There are now in this Territory some nineteen or twenty furnaces, mostly small shaft-furnaces. The aggregate production is, however, only about fifteen tons of base bullion daily—a proof that the furnaces are run very irregularly, as an inspection of the works also sufficiently shows. Ignorance of the nature and proper treatment of the ores is one reason. The furnaces are run so badly that salamanders are of frequent occurrence. In fact, I do not believe the average campaign exceeds a week.

The Messrs. ROBBINS, aided by their skillful metallurgist, Mr. RÖGER, have erected excellent works for the treatment of galena ores, comprising a large reverberatory roasting furnace, with a smelting-hearth underneath. These works are not yet fairly in operation; and there appears to be some difficulty in obtaining a regular supply of the kind of ore for which they are calculated—not so much because there is a lack of galena among the ores produced, as because the miners do not like to sort them out, and prefer

to mix all their ores together, and ship them in that condition. The Robbins works are, moreover, interesting, as the only ones, so far as I am aware, employing the coal of the Green river field as fuel. Experience thus far has shown that the coal is not of uniform quality, even when coming, nominally at least, from the same mine. The best of it will probably be a moderately good fuel for the reverberatory processes. The shaft furnaces employ charcoal.

The loss of lead and silver in the shaft-furnaces is very great. It may almost be said that the bullion produced is not richer in silver than the ore. I feel sure that in many cases, moreover, half the lead is lost, in the slag, or up the chimney. The astounding ignorance of the smelters may be illustrated by a circumstance which I personally noticed, the other day. At one of the principal works I saw heaps of hematite iron ore and of limestone, which I found were brought there (the hematite at a cost of $17 per ton) to mix with the silver ores, and "make a slag." As the ores contain plenty of iron, and more than plenty of lime, it may easily be understood that what this addition really made, was not a slag but a salamander.

Yet in spite of these most evident losses, the smelting works in general are reported as paying high prices for ore—prices, in many cases, which would exclude the possibility of profit, even under good management. The only explanation I can offer is, either that the proprietors of the furnaces are losing money without knowing it—a thing which may easily occur to persons inexperienced in the smelting business—or they are running the furnaces at a loss, with the intention of selling mines, on the strength of alleged favorable results. I fear that in many instances the latter is the true explanation. Certain it is, if anything in metallurgy or mathematics is certain, that the smelting-works now in operation cannot be legitimately making money, operated as they are, and paying what they do for ores.

As for the mines, the principal ones are deposits in limestone. The Emma, for instance, resembles in character the deposits at Eureka, Nevada, though less extensively exposed. All the mines appear to be worked in such a manner that it is impossible to say how long they will continue to be productive, there being little or no ground opened in advance of actual extraction.

The blighting curse of litigation rests upon almost every good mine in the older districts. The mining laws are vague and bad, and the Territory is infested with unscrupulous jumpers and black-mailers. There are at least three parties fighting over the Emma mine. One of the claimants, Mr. JAMES LYON, alleges that he was an original locator, and moreover, if that plea isn't good, then he has bought lately a third title which covers the whole thing. Then there is a San Francisco company, boasting of large capital and numerous outside titles which "lay over" everything. Meanwhile, the Emma Company, now in possession, is taking out ore as fast as possible, and making a good deal of money, though not nearly so much as popular rumor declares. But I will say more of this mine in another letter. The LYONS suit is to come on in October before Judge CURTIS, of Boston, as sole referee. His appointment seems to satisfy both parties. Certainly he is thoroughly acquainted with law in general; and probably he is ignorant of the abominations of American local mining laws.

The Emma is by no means a solitary instance. Law-suits are springing up all over the Territory; and we shall have a new crop of mischief from the indolence and neglect of the Federal Government with regard to the mining law. For my part, I am more and more thoroughly convinced that the men to whom the United States is virtually giving away its mineral land are not the proper persons to regulate the tenure of their titles. One would scarcely say to his best friend, "Here; take my property on your own terms!" and the penniless speculators in mining claims can least of all be trusted to make the laws defining their own rights. In my opinion, the United States law, which declares all citizens entitled to mine upon the public domain, gives them no right to any dog-in-the-manger titles. The object of the law is to develop the mines, not to help a few individuals lock them up, and demand high prices for them. A discoverer has the right to occupy and improve; this is properly his only right; it is all he can sell; and until the mine is purchased of the United States, nobody can have any rights in the premises which abandonment or neglect to improve does not defeat. Here in Utah, there were many mines discovered some years ago, and abandoned. Now a second crop of discoverers has come; and the old ones have returned in swarms, to claim their "rights."

R. W. R.

MINING SUMMARY.

California.

ALTA HILL.

From the Grass Valley *Union*: We paid a visit lately, says this paper, to the mines and works of the company operating in Alta Hill. The Altona Company, whose main tunnel is 350 feet, is now taking out gravel on a cross-cut being run south from the tunnel for the purpose of ascertaining the width of the lead. This cross-cut is in fifty feet, and gives no indications as yet of the width of the lead in that direction. The gravel averages three to five feet in thickness, and shows gold while being picked up by the miner, and the pay dirt, as hoisted, prospects from twenty-five to sixty cents to the pan. The Superintendent, Mr. John JEFFREY, to whose courtesy we are indebted for the opportunity of exploring the mine, intends starting a cross-cut northerly from the tunnel at an early day, in order to ascertain the width of the lead in that direction. He also intends sending, in the course of the week, some twenty-five tons or more of the gravel and cement from the upper and the lower strata of the mine to a custom mill, for prospecting purposes for a test, preparatory to the erection of ample machinery for mining and milling purposes. The Hope Gravel is working as usual. This company, we learn, has engaged the services of Mr. J. JEFFREY as Superintendent of their mine and works, who will supervise the Altona and Hope in the future. Mr. JEFFREY is a practical miner, and an operator on Alta Hill for many years, and is, in all probability, better posted in mining in that locality than any man in Grass Valley, and the company are fortunate in securing his services. It is an opinion of long standing with miners, that the Hope Company have not been working on the original lead, and we confess to favoring that opinion. While they admit there is gravel and cement and some gold in that portion of the Company's ground being worked, they assert also that, as in the case of claims worked at Randolph in former years, this gravel and cement is but an out-break, or slop-over, from the original channel. If this opinion be correct, Mr. JEFFREY, with his experience, will be likely in a short time to tap the original lead, if it is to be found in the company's claims. We hope he may be successful, and thus place the company among the richest operating in this district. Alta Company No. 3 is working under full headway, and taking out gravel and cement, for the crushing of which a 10-stamp mill is in course of erection. Hope Company No. 2 are not working their claims at present. The Dartmouth Company have erected a water-mill for crushing the gravel they are taking out from the upper strata of Alta Hill, but are unable to start up, water for the purpose not being attainable.

MOB-RULE IN AMADOR.

From the Sacramento *Record*, July 27: The situation at Sutter Creek, Amador county, is a very peculiar one at this time. The place is virtually in possession of a lawless mob, who refuse to allow peaceable men to work for their living, or property-owners to use their own judgment in employing or retaining workmen. The only cause of the trouble which exists is alleged to be the demand of the men of the Miners' League that all who worked for the mine-owners during the late strike should be discharged. Of course this was out of the question; but because the arrogant insolence of these men was not complied with, they have availed themselves of the absence of the militia to commence a reign of terror. Blood has been shed, and at least two men, one an employé of a mine, and the other a ruffian of the League, have been killed. At present nothing is being done. The mine-owners are powerless, and their officers are in great danger. The Amador mine is on fire. The mob parade the streets, and every man who dares to express an opinion adverse to their proceedings runs the risk of losing his life by knife or pistol. It seems, however, that the condition of things is so little alarming to the Executive that he does not deem it advisable to move at all in the premises. It is said he hesitates to take action before he has been shown that the civil officers are powerless to enforce the laws. It is true that there is no protection for life or property; that intimidation is the governing power; that the telegraph office has been put under mob surveillance, and that assassination has been committed in at least one instance. The fact that the Sheriff and the county officers are said to favor the Miners' League for political reasons, cannot, we presume, be known to Governor HAIGHT, but if it is known, he exercises a prudent reticence in regard to it. How the matter is to end under such circumstances it is difficult to foresee. The Governor is afraid to move, and makes the Sheriff his scapegoat. The Sheriff, being a friend of the mob, will not stir against them. The mine-owners will, apparently, be compelled to abandon their enterprises and close their works indefinitely, and, in removing their capital to more favored countries, they will be able to inform the world that in California the most important and beneficial enterprises may at any moment be stopped and paralized by mob action—that kind of demonstration being winked at by the Democratic Governor, who is so eager to secure the votes of the mob that he utterly neglects to protect the rights of the citizens. The effect of such a statement upon our mining and business enterprises generally, may be imagined by those who have any acquaintance with the proverbial timidity of capital. It will cause a blow to the interests of the State generally of a very serious character, but then, on the other hand, it may secure Governor HAIGHT some two or three thousand votes among the riotous miners.

DEEP PLACERS.

The mining review of the *Commercial Herald and Market Review*, July 28th, contains the following: Within the past three months powerful drilling machines have been used for the first time with success, for driving tunnels through the hard rim-rock, that must often be penetrated to reach these deposits: thereby largely reducing the cost of these works, and, what is of still greater consequence to the miner, greatly expediting their construction. More recently, the comparatively inexpensive plan of artesian boring has been adopted for prospecting this class of claims, in lieu of the shafts and other costly excavations formerly resorted to. A great gain, both in time and money, promises to be achieved through the employment of this means for ascertaining the level of the bed-rock in these gold-bearing channels and basins. Through the use of more powerful streams of water, effected by means of a greater head and an improved style of nozzle, the impacted gravel found in the deep placers is now torn to pieces and thoroughly disposed of, obviating the necessity for the aid of cement-mills in many localities. The unusual drought prevailing through the past winter and spring has proved detrimental to every branch of placer mining in this State, except river-bed and bar operations, which the low stage of water has tended to favor, enabling miners to get their wing and cofferdams in early, and thereby increase their chances for a long working season. In this connection it may be observed that a novel plan has recently been hit upon for reaching these deposits under the beds of running rivers. It consists in the sinking of a large iron tube in the middle of the stream, settling it until it has reached a solid foundation. From the bottom of this the work of excavation is carried on under the river-bed, the auriferous earth and débris being removed through this opening. By this method the Great Crevice—a remarkable fissure crossing the American river, and known to be rich in gold, but which had heretofore baffled every effort made in working it—is now being successfully explored; and it is probable that these iron tubes will come into general use in the prosecution of similar enterprises hereafter. Despite the drought, the product of gold in California will be large the present season, many of the hydraulic companies having already made heavy clean-ups, while the drift-claims are generally turning out better than for many years past, the scanty supply of water affecting them less than most other kinds of placer mines. During a recent tour across the central portions of Placer, Nevada, and Sierra counties, leading through all the great centres of hydraulic washing, we were able to detect many signs of renewed activity and returning thrift, with less complaint than we have been accustomed to hear for many years before. Among the drift diggings these marks of prosperity were still more noticeable, many of these claims yielding with a generosity rivaling that of the

early days of mining. The Yule ground, thirteen hands working, yielded $4,500 net profits for the three weeks preceding the 1st of July, with every prospect of being able to not only keep up, but largely increase these returns for an indefinite period in the future. This property has now become regularly dividend-paying—$5,000, the result of its accumulated earnings for the past month, having been recently disbursed to the stockholders. The Morning Star claim, adjoining the Yule, has for some time past been doing nearly as well, with others in the neighborhood not far behind. The Weske grounds, situated on the same channel, a little lower down, was doing even better than this, having, with a working force of twenty men, averaged a weekly profit of $4,000 for several months past. Here one of those rich spots had been reached, common in these old river-beds, and which all engaged in working them are likely to come upon in the course of their explorations.

OTHER DEPARTMENTS OF MINING.

The receipts of bullion at San Francisco, exceeding nine millions of dollars for the past quarter, sufficiently attest the healthful condition of this industry generally; especially when it is considered how large a percentage of our silver is now diverted eastward through overland channels, without being reported at this point, as formerly. Besides the great activity observable in the deep placers of California, attended with more than an average yield of gold, much attention is also being directed to the working of the quartz mines in this State, many of which are looking better and yielding larger returns than ever before. The past quarter has afforded some cases of very remarkable production in this line, a four-stamp mill running on ore from the Green lode, near Auburn, Placer county, having turned out $50,000 in two weeks—surpassing, perhaps, anything on record. The St. Patrick's mine, in the same vicinity, suspected by many at first as being a mere pocket-vein, because of the large quantity of free gold it carried, is also proving itself to be not only a rich, but permanent mine; a compact and continuous vein of good size, and carrying high-grade ores, having been developed in all its shafts and levels at a depth of 220 feet. About Grass Valley, as well, also, as at nearly all the other quartz mining centres of the State, this class of mines is exhibiting like favorable features, and yielding fair, and, in many cases, large returns.

Colorado.

From the Colorado *Miner* July 27th:

The destruction of the Washington Mill is, it seems, nearly total. The machinery in the mill is wholly destroyed, with the exception of the Dodge crusher, which can be rendered available with some slight repairs. The engine is ruined, but the boiler may be patched so as to become useful again, but the expense might be fully as much as a new one. The concentrators are warped and twisted so badly as to render them unfit for use. Besides the concentrating ores on hand, there were several tons of first-class ore, which had been crushed and put into bins, to remain until sold or shipped. Of course none of the ore was injured by the fire, but there was some small loss in gathering it up.

One half of the 4th of July lode has been sold for the snug sum of $10,000. The lode was discovered on last Independence day, and now the fortunate discoverers have a snug little competence and one-half of their lode to mine on as long as they live.

SUMMIT COUNTY.

From the Colorado *Register* of August 2d:

About half a mile above Montezuma at the eastern base of Glacier mountain, the St. Lawrence Silver Mining Company's lodes and reduction works are located. The Silver Wing is about 500 feet up the mountain above the works. A tunnel is now being driven which will be in 200 feet by the first of September, which will give 200 feet of stoping ground. The crevice is five feet wide, and the vein of solid mineral about seventeen inches in width, which produces about one ton of ore to the foot advanced. A true fissure vein, with a light dip, assays from 30 to 180 ounces of silver per ton, and contains brittle silver, zinc blende, antimony, grey copper and galena. The ore increases in quantity as the tunnel progresses.

About 300 feet northward is the Napoleon lode, in which a tunnel is also being driven, and will correspond with the Silver Wing in length and stoping ground, when the contract for running the tunnel is completed. The ore is similar to that of the Silver Wing, yet gives a larger assay. A track covered with sheds will connect the Napoleon with the Silver Wing. At the tunnel entrance of the latter commodious ore houses are being built for the reception of the ore from the two lodes, from which a double-track tram-way will be laid, on which the ore will be conveyed from the two lodes through the ore-houses to the rock-breaker. The ore will then pass from the rock-breaker on to the drying floor, which will be heated by the escape gases from the furnace. From this it passes to the stamps, and is then conveyed by two endless chain conveyances into the weighing hopper. After weighing, it is dumped into the receiving hopper, at the base of the furnace. The ore is then raised by an elevator to the feeding-hopper at the top of the furnace. After roasting and chloridizing, it is drawn from the base of the furnace and conveyed to the cooling floor. After cooling, it is passed into the concentrator, then into the amalgamation pans, after which it is retorted.

The main building is 30x50, contains one of Howland's 10 stamp rotary batteries, two of WHEELER & RANDALL'S amalgamating pans, (all cast-iron,) settler and retorts. The furnace building will be 35x40, and 50 feet high, ore-house 20x40, and blacksmith and tool shops adjacent. The works will be operated by a 50-horse power engine, their capacity will be ten tons per day, and next spring another battery of stamps and two additional pans will be put in, which will double the capacity. The Airey furnace, conveyances, etc., will be similar to STEWART'S works at Georgetown, and the furnace will be constructed by the same men who built that of Mr. STEWART'S. By the arrangement above described, it will be seen that most of the labor will be performed by simple mechanical agencies and machinery, requiring hand labor only in passing the ore into the weighing hopper before stamping and after retorting. I have written this lengthy description, because there is reason to believe that the new works will mark a new era in Snake River district, and will be as perfect as any now constructed, and will give every owner of a lode in the district an opportunity of getting his ore reduced on reasonable terms, as the company propose reducing custom ores, and think they will be able to reduce 30 ounce ore with a good profit to the miner. The works will be completed early in September, and will then commence running. W. F. WITHERELL, Esq., is the company superintendent. He has made a few improvements on those inaugurated by his predecessor of last summer, and during his brief visit to the smelting works in Gilpin and Clear Creek counties, and obtaining the practical experience of others, he has become as familiar with the operations of such works, and the methods used for treating the various classes of ore, as he would be by many years residence. He has the best wishes of the miners of Snake River and the writer's, for success in his new vocation.

The Boston Silver Mining Association, of St. Johns, are progressing with their new smelting works. Their lode, the Comstock, is considered the best opened in the Territory. From 1,200 to 1,500 tons of ore (exclusive of what is in sight and ready for stoping) is in readiness for the works, so that it will be seen there will be no lack of ore when the works are completed.

The Chatauqua lode, but a few hundred feet below timber-line on the southeast side of Glacier mountain, owned by TELLER, BULL & Co., is being worked by a shaft which is down 33 feet. The crevice is six feet between walls, and the ore-vein from six to ten inches wide. About 100 tons of ore are out, every piece of which shows more or less gray copper. Four samples were taken from the pile last fall, which gave an average assay of 363½ ounces silver per ton. The ore shows native and brittle silver, zinc blende, gray copper, galena and sulphate of baryta.

THE GULCH MINES ALONG CLEAR CREEK.

About two hundred yards from the junction of North Clear creek with South Clear creek, and within sight of the road-bed of the Central Colorado railroad, S. S. CHAMBERS & Co. are gulch mining, and so intent are they in taking out gold from their claims, that they are totally oblivious of the fact that railroads and their adjuncts are engrossing the attention of the people of Gilpin county. It is nearly five years since these enterprising miners first drove their stakes in this locality, and only within the last season's work have they realized anything over the cost of living. This season their mine is paying over $5 per day to the man. Perseverence of this character will win every time, and we trust that success will attend their efforts in the future.

Next up the creek comes D. F. PAGE, who was amusing himself with a pick that for size and symmetry compares favorably with the relics of the stone age. Queer amusement, some people will say, but they know nothing of the fascinations connected with gulching, or the taking up of a steady and even profit of $5 per day.

About a half mile above PAGE'S claim we come to the placers worked by BLAKE & Co. This company have nearly a quarter of a mile of fluming, and their facilities for economical working are a trifle better than those below. This mine as compared with the placer mines of California, mentioned a few days since, gives a yield per cubic yard fifty times as great. Last week, the "pit" they worked out, 18 feet wide, 30 feet long and 10 feet deep, produced 22 ounces of dust, or nearly $2 00 to the cubic yard. Mr. BLAKE informs us that, were the ground "original," and not cut by washes of recent times, his whole ground would average half an ounce per cubic yard, if the water was sufficient.

HAMILTON'S mine comes next, and he is what might be termed a combination miner, depending (not wholly) upon his herd of cattle, numbering over 40 head, mostly milch cows. In the morning, from dawn until 8 or 9 o'clock, he is engaged in milking. The balance of the day until 3 or 4 o'clock in the afternoon, he is a devoted gulch miner, realizing from his own individual labor alone three and four dollars per day. We believe in combinations of this character.

J. W. FRIES, a mile above, (lots of room between,) is "scratching gravel" with good results. A greater part of the summer he has been opening up ground, and only within the last month has his labor been rewarded with the "substantial" in paying quantities. He averages $4 per day to the man.

PITMAN & WILEY, half a mile above, have been in "boulders" all of the season. Gulch as well as lode mining requires open ground, to be carried on successfully. Messrs. PITMAN & WILEY are opening their claims, and expect to get their flumes and ground in readiness for next spring's campaign.

HUGGELL & Co., next in rotation, and at least half a mile above P. & W's mine, claim our attention. Their fluming extends down the creek over a quarter of a mile from the breast. The mine is not yielding as largely as last year, but with the present supply of water good wages are made.

Three miles above ALEX. CAMERON is operating. This is, beyond a doubt, the most extensively worked placer in Colorado. Gulch mines, like lode claims, are spotted or pocketty, and so it is with ALEX'S property, which has not been paying as well as usual. Still, his features are not drawn very long, for, as he says, barren spots will not last forever. From these notes it will be seen that placer mines—even in Gilpin county—are not of the past, but belong to the present, and the only requisite necessary to place the placers of Colorado upon an equal footing with the annual productions of quartz mines, is a combination of labor. When all of our placers are extensively reworked their production will rival that from quartz mining, and probably yield a larger profit.

Arizona.

FROM the Arizona *Miner*, July 22nd. Recent news from Bradshaw is of the most favorable character. Messrs. Shoup, Goldwater, Behan and others, arrived here, direct from the mines, a day or two ago, and inform us that the several companies at work on the Tiger and other prominent lodes were taking out very rich ore. Riggs & Co., at a depth of over seventy feet, had cut across a vain of quartz twenty-four feet in thickness, eighteen feet of which we are assured, was good, paying ore. The Discovery company were sacking ore worth $800 or $1000 to the ton, may be more, as it was literally covered with pure silver-

A very rich piece of gold quartz had been brought to Bradshaw, from a ledge just found on Humbug Creek. Its exhibition created quite an excitement, and induced many persons to start out after extensions, and other ledges.

McCrackin and party, while proceeding east, towards the mouth of Black Canyon, passed through a rancheria which Indians had just left, and had not proceeded far, when a great many savages raised their heads from behind rocks, uttering threats, and apparently, preparing for a raid on Mac's party, which, numbering only seven, concluded that discretion was the better part of valor, and took the back track to Bradshaw, where they arrived safely.

Governor Safford was examining the mines, and expressed the opinion that some of them were better than the best Nevada mines.

The Del Pasco mill was nearly completed and ready for crushing, which it may commence doing Saturday next.

Mr. Miner and a portion of his party came in here Sunday last, and on Monday started for Adamsville, on the Gila, to supply themselves with flour, and await the coming of other persons from this vicinity. The party have great hopes of finding rich diggings somewhere north of the Gila, in the eastern portion of the Territory. Many old Arizonans are going, and it is said that Governor

Saffork will also take "pot-luck" with the party, he having now in his possession a large piece of gold which was picked up in the Pinal country.

We have nothing new to report from the other districts of this vicinity, further than the finding, recently, of a rich silver ledge near Black Canyon; Yes, there is one other item: Mr. Opdyke showed [illegible] yesterday morning, a huge slab of silver bearing quartz from the Davis lode, which pleased us very much, it being the largest and richest piece of ore we had seen for a long time. The Davis, is undoubtedly a "big thing."

MOHAVE COUNTY.

Great was the wonder created here recently, by some ore from a newly-discovered ledge, near Beale Springs, Wallapai District, Mohave county. Jerry Ridgeway, the discoverer, sent this ore to Messrs. Niles and Mix, who had four pounds of it worked, which yielded three ounces of silver and gold, worth four dollars per ounce. Of course, Messrs. Niles and Mix, and several others, are going to see, and perhaps, work the interests they have been so fortunate to acquire, upon this very rich lode.

Miners from Nevada were constantly arriving in Wallapai District, and work was steadily progressing.

Nevada.

From the Gold Hill *News* of July 26th:

MILL MATTERS.

The Crown Point Mining Company have purchased the Yellow Jacket mill, on Carson River, just below Empire, and will take possession of the same on the first of August next Tuesday. The Carson *Register* says: The old machinery and gearing, including the turbine wheel which has supplied the principal motive power heretofore, are being removed, and new machinery to be driven by steam exclusively will be substituted. The old and efficient Superintendent, JOHN HANSON, will remain at the same post under the new management. The machinery is now being removed, but a portion of the stamps will be kept running until the ore on hand is cleaned up. The new machinery will be capable of running forty stamps, and will have two sets of boilers for emergencies, thus rendering the new mill (which it will really be) the most reliable one on the Carson river, as low water will not affect the driving power. This change to steam will also increase the water power of the Mexican, above, and the Brunswick mill, below, as the former can appropriate a good portion of the water heretofore passed by to the Jacket, while the Brunswick dam can be raised considerably without flooding the Jacket turbine. The Mexican mill has been shut down for two days, on account of a breakage in the gearing.

MINING ITEMS.

Considerable low grade ore is being taken from the old upper workings of the Kentuck mine, and the 600 and 700-foot levels also yield plenty of ore of a high grade. The 400-foot level is being opened out for practical working. The Caledonia mine is yielding a superior quality of ore from the breasts between the 200 and 300-foot levels. The Buckeye mine is yielding no ore at present, but the drifts north and south from the old incline shown cosiderable ore of good quality.

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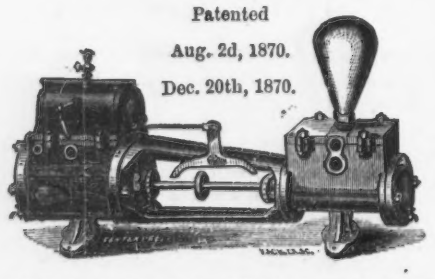

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U. S. PATENT OFFICE,
WASHINGTON, D. C. June 26, 1871.

On the petition of J. D. WEST of East Orange, New Jersey, praying for the extension of a patent granted to him on the 29th day of September, 1857, for an improvement in pumps. It is ordered that the testimony in the case be closed on the 29th day of August next, that the time for filing arguments and the Examiner's report be limited to the 8th day of September next, and that said petition be heard on the 13th day of September next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE,
WASHINGTON, D. C. July 15, 1871

On the petition of DELOS W. GITCHELL of Newburgh, New York, and LUTHER W. BADGER of Elizabeth, New Jersey, praying for the extension of a patent granted to them on the 2oth day of October, 1857, for an improvement in manufacturing Seamless Felt Garments. It is ordered that the testimony in the case be closed on the 19th day of September next, that the time for filing arguments and the Examiner's report be limited to the 29th day of September next, and that said petition be heard on the 4th day of October next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE.
WASHINGTON, D. C. June 23, 1871.

On the petition of WILLIAM PLUMER of Boston, Mass., praying for the extension of a patent granted to him on the 5th day of October, 1857, for an improvement in Rock Cutting and Drilling Machines. It is ordered that the testimony in the case be closed on the 5th day of September next. that the time for filing arguments and the Examiner's report be limited o the 15th day of September next, and that said petition be heard on the 20th day of September next.

Any person may oppose this extension.

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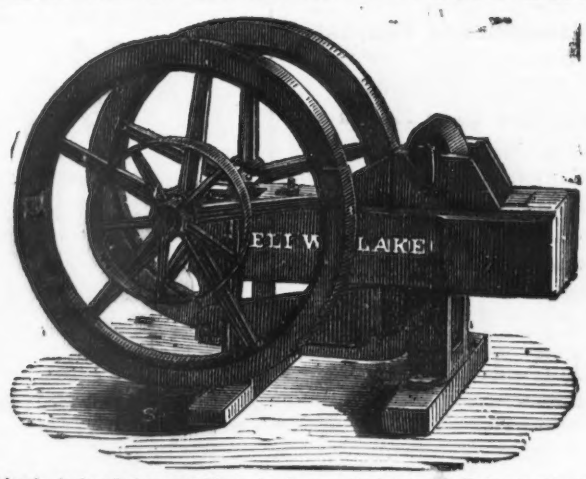

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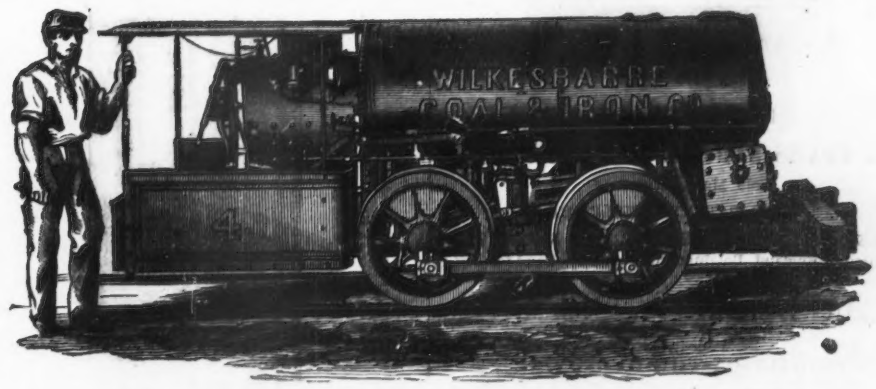

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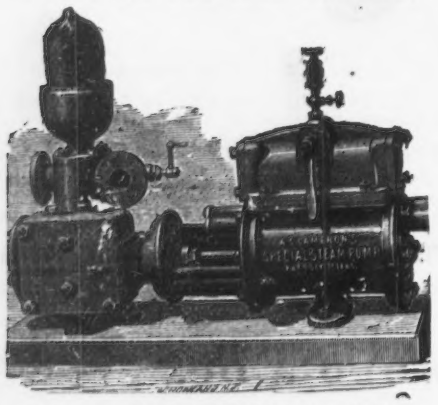

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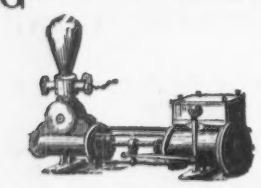

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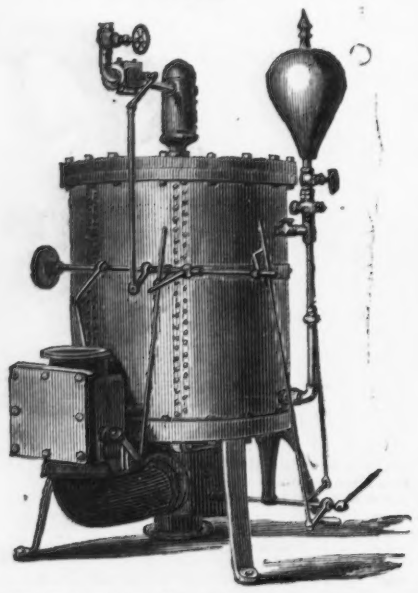

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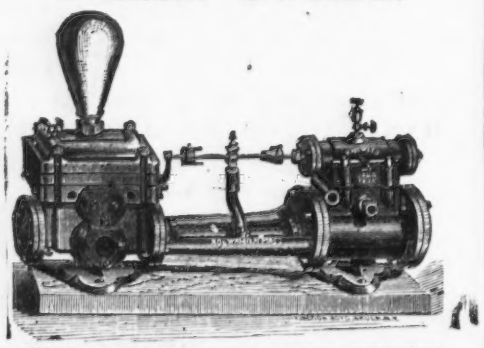

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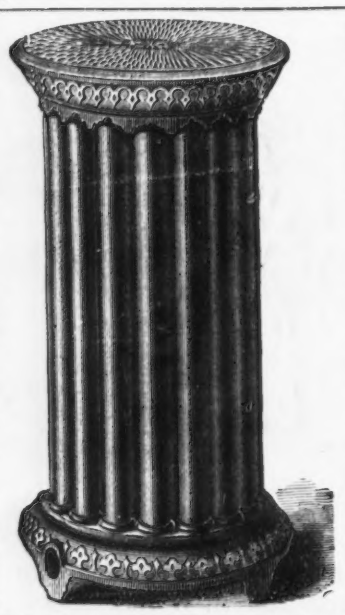

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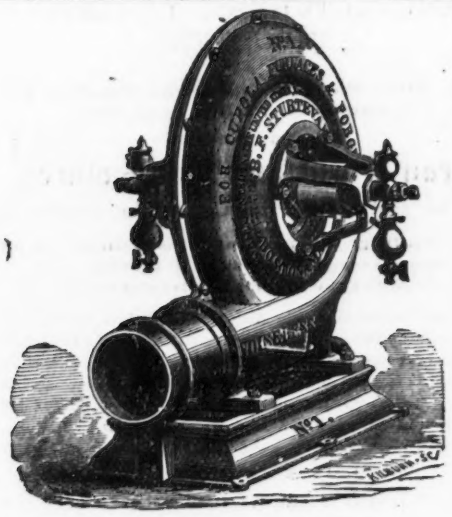

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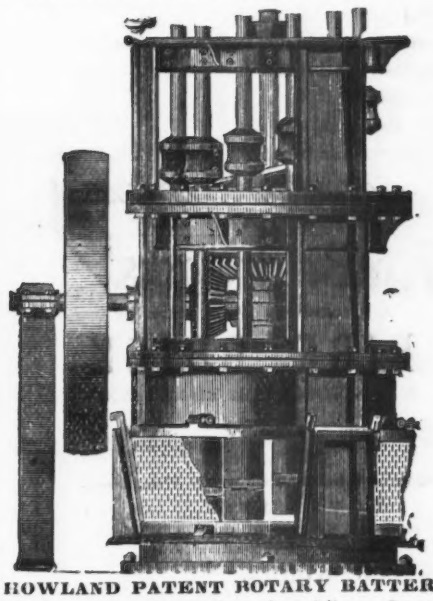

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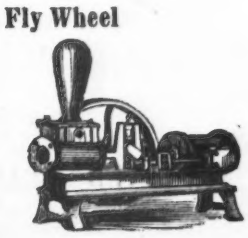

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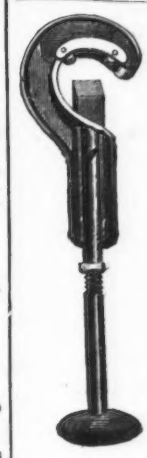

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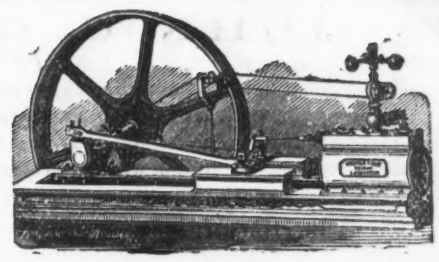

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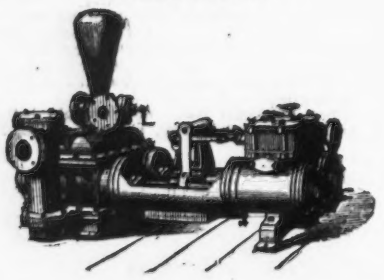

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